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DOES THE UNDERSTANDING OF WHOLES REQUIRE BOTH ANALYSIS AND SYNOPSIS?

by

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CHAPTER I

THE ISSUES AND THEIR BACKGROUND

The central problem of this dissertation is stated in its title: Does the understanding of wholes require both analysis and synopsis? This question implies that there is a difference between the analytic and synoptic methods. To find this difference the dissertation examines views of men who say they use analysis or synopsis in order to understand wholes of various kinds. This dissertation asks whether the distinction between analysis and synopsis is more than verbal. It asks what a synoptic method over and against analysis might do for understanding wholes better. But before these questions are asked, the meanings of "whole," "sum," "part," and the like must be clear. And finally, it is asked how recent developments in natural science show, as some men have claimed, a "synoptic" or "holistic" method. At the end of this chapter the specific content of later chapters will be outlined.

A. The Contemporary "Organismic" Point of View.

In recent times "organismic," "holistic," or "ganzheitlich" philosophies have become prominent and popular. They use, in various ways, the conclusions of natural scientists and try to show that all entities in the world have a structure something like that of a living thing. They say that "wholeness" is the most important characteristic of every entity. Such developments in present physics as field theories, the quantum of action, and the "uncertainty principle" are

taken, though sometimes indirectly, as supports for this "holistic" or "organismic" perspective. Biology furnishes even more evidence and encouragement: the complexly patterned activities of the organism and the emergent products of evolution seem patently to defy a "dissecting" method. Interpreters of the "organismic" and "holistic" perspective have derived considerable impetus from Gestalt psychology [1] which emphasizes the dynamic patterns of experience as opposed to an elementaristic or machine theory of sensations.

All these philosophies, it will be seen, involve the distinction between a true, genuine, or organic whole and a mechanical aggregate or collection. In most cases they maintain that the most fundamental and pervasive wholes are those of the former type, whereas a now-antiquated analytic or abstracting method mistakenly tends to reduce all wholes to mere aggregates. For Burkamp the basis of contrast is the new versus the old intellectual method:

> War für den jungen Descartes und seine Zeit, ja für die ganze Zeit des strengen Rationalismus bis Leibniz der konstruktive Aufbau der Erkenntnis aus elementaren Beziehungen und Eigenschaften von Elementen der Schlüssel zur Lösung aller Fragen, so ist es heute im Gegensatz dazu jugendlich himmelstürmende Geister die Synopsis und Synergetik eines Ganzen im Schauen, im Denken, in der biologischen Wirksamkeit. Sogar der Physik und der Mathematik wird diese bessere Denkweise dringend zur Annahme empfohlen.[2]

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1. Consult bibliography for explanation of standard abbreviation system used in footnotes. See von Mises, KLP, 317ff on relation of Gestalt psychology to contemporary organismic perspective. See below, Chapter V.

2. SG, vii. Burkamp insists that all wholes with self-perpetuating structure (the earth, a proton, organisms, or the

The classical period of synoptic and "holistic" thought, Burkamp notes, was that of Hamann, Herder, and Goethe in contrast to the epoch of "partial-relationism" in which Galileo and Descartes lived.[3]

Similarly, the basis for Smuts' philosophy, called "holism," is the difference between the hard, limited, and rigid intellectual tools of the last century and the more plastic and fluid ones of the present. Smuts offers as the basic thesis of his philosophy:

> Every organism, every plant or animal, is a whole, with a certain internal organization and a measure of self-direction, and an individual specific character of its own....Not only are plants and animals wholes, but in a certain limited sense the natural collocations of matter in the universe are wholes; atoms, molecules, and chemical compounds are limited wholes.[4]

Such a thesis implies that a rigidly mechanistic and analytic method of investigation is inadequate since in a whole the "togetherness is not mechanical" and since the whole "is more than the sum of its parts."[5] Smuts does not go very far toward developing a specifically "holistic" methodology. Along this line he makes the suggestive observation that in the nineteenth century there was a dominance of "partial and misleading abstractions" as the rigid categories of physics

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state) and all causal wholes (a locomotive or an organism) show conformity to purpose as one of their primary characteristics. See SG, 88, 59, 102-105.

3. Ibid., 349.

4. HE, 98.

5. Ibid., 101.

were applied to life and mind to miss the structured, intermingling-field character of all events. Throughout Holism and Evolution Smuts interprets developments of modern science, especially physics and biology, as indicating that everything in the world -- a collection of matter, an organism, consciousness, and personality -- is a whole exemplifying the basic category of individuality.[6]

Whitehead's philosophy is probably the most sophisticated and circumspect statement of the "organismic" point of view. The "philosophy of organism" is an attempt to show how every actual entity is a "cell-complex" or "system of all things" which mirrors the universe. Actual entities express the ultimate metaphysical truth of atomism but they are complex. An actual entity is a "unity of feeling," a process, ens prehendens.[7] Germinal to Whitehead's view is a contrast between the abstract and concrete way of looking at things:

> The whole concept of materialism only applies to very abstract entities, the products of logical discernment. The concrete enduring entities are organisms, so that the plan of the whole influences the very characters of the various subordinate organisms which enter into it.[8]

Whitehead everywhere exposes the serious error of mistaking an abstract object for a concrete and genuinely whole one. This is the fallacy of "misplaced concreteness." Even physical science, in reconsidering its foundations so as to get out of

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6. See 16-18, 140, 98, 107.

7. Whitehead, PR, 53, 65, 334.

8. SMW, 115.

difficult theoretical ruts, "must recur to a more concrete view of the character of real things, and must conceive its fundamental notions as abstractions derived from this direct intuition."[9] Since abstract thinkers fail to take account of "the whole evidence," they must miss essential features of every event, for example, the element of attainment or realization.[10] Taking his cue from Whitehead's "reconstruction," O. L. Reiser applies the notion of organism and Gestalt to space, time, atoms, and the cosmos itself.[11] Again, Whitehead's views have noticeably influenced the thinking of Charles Hartshorne. They have helped to shape his "societal psychism" which entails an "organismic" interpretation of physical phenomena and a persistent search throughout the realm of existence for "individuals" marked by various degrees of integration.[12]

In a book entitled The World As An Organic Whole N. O. Lossky opposes the organic view to materialistic atomism. "Organicism" means the priority of the whole or system to the parts. Lossky states his basic thesis:

> It is the whole that exists primarily and the elements can exist and come into being only within the system of the whole....In other words, the whole is prior to the parts; the absolute must be sought in the domain of wholeness or, rather, beyond it, and certainly not among the elements; the elements are in any case

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9. Whitehead, SMW, 196.

10. See ibid., 268, 136, 152.

11. See Art.(1934), 198-200.

12. See BH, 287-289, 190. Cf. Art.(1935), 290-295.

> derivative and relative; i.e. they only exist in relation to the system of which they are members.[13]

A real or organic whole stands in contrast to a mere summation of elements. It is what Köhler means by Gestalt. Lossky is aware that such views entail distinctive methodology. The notion of organic whole lies at the root of every judgment about any object because every object must be discriminated out of a given whole. Lossky's defense of "organismic" philosophy plainly suggests the mare's nest of epistemological problems that hover in the background.[14]

Marvin Black's book entitled The Pendulum Swings Back is a popularized defense of views like those of Lossky, Smuts, and others. It is guided by the methodological thesis that

> Science today is not content with the purely mechanical explanation of reality but has a much broader vision and is "seeing things together" as parts of a unified whole. Contrary to the dogmatic assumptions of certain schools of thought, Science today is not opposed to the synoptic attitude but rather encourages it.[15]

By synoptic attitude Black means a method of investigation which takes into account what poets and artists have "intuitively felt, rather than intellectual perceived, the vision of things as totalities,...in their wholeness." Contemporary scientific methods and findings, Black offers, require a non-mechanistic philosophy behind physical science and a recognition

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13. WOW, 2.

14. See ibid., 11-12, 2.

15. Black, PSB, 8.

of a "more beyond" in physico-chemical behavior.[16] For the most part, however, Black's book is more of a statement of scientific results supporting an "organic view" than it is a self-conscious and radical inquiry into methodological problems.

Many other thinkers are inclined toward the "organismic" thesis.[17] But often they are not so circumspect as to its grounds and so precise in their contrasts. T. H. Howells' book, ineptly entitled Hunger for Wholiness, applies to the study of human nature in life, play, art, and religion a thesis much like that of R. H. Wheeler who holds that "The logical pattern underlying twentieth century science is...organismic in that the major interest in science lies in the part-whole relation."[18] Like the years around 1250, 1650, and 1820 the present era is, according to Wheeler, another cyclical swing toward the "organismic position." The superficial sweep of Wheeler's generalizations is matched by Howells' too gratuitous and uncritical

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16. Black, PSB, 36-37, 20-21, 55-56.

17. With basic motives quite unlike those of Marvin Black or N. O. Lossky the Marxian dialectical materialists also aim to show that contemporary scientific results require a nonmechanistic perspective. "The mechanistic world picture," writes A. Emery, "is out-dated and discarded." The characteristic traits of modern natural science, Marxists hold, seem to support and require a dialectical philosophy: "Matter, movement, space and time are one continuum, a dialectical unity of content and form....From the whole of the world process special events originate without losing their unity with the whole. Each individual phenomenon, everything we perceive is such a special process. The perceptible matter which mechanics calls material point is merely a point of juncture of the non-immediately perceived continuum." (Emery, Art.(1935), 18-20. Cf. Somerville, Art.(1938), 233; Haldane, Art.(1934), 79.) In the philosophy of dialectical materialism togetherness, organization, or wholeness and process are the central categories.

18. Art.(1936), 26. See 61, 26-27. Cf. Howells, HFW, 86.

thesis that the relativity theory in physical science implies that the thought-pattern of the present era is "organismic."[19] In a later chapter there will be occasion to notice how the relativity theory is a continuation of the work of Galileo and Newton, using the same methods in wider fields. Nevertheless there are certain phases of recent physical science which do lend credibility to the synoptic and "organismic" point of view.[20]

As Whitehead, Burkamp, and other contemporary thinkers have noticed, the "organismic" view is closely related to the romantic emphasis in literature and philosophy. Writing of the mental habits that shape the history of ideas, A. O. Lovejoy suggests that in a romantic period

> you find the simple becoming an object of suspicion and even detestation, and what Friedrich Schlegel called eine romantische Verwirrung the quality most valued in temperaments, in poems, and in universes.[21]

With a romantic emphasis the "organismic motive" predominates. Wordsworth's protest that "We murder to dissect" reflected his appreciation of nature as a living whole not amenable to the ways of the scientist and analyst. Goethe, who is often referred to as romanticist par excellence, would not tolerate mythology and legend in science to the disadvantage of observation and

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19. See Howells, HFW, 18. Wheeler writes that the 1255...1935 thought-pattern has 28 characteristics including: part-whole relation, system, rationalism, teleology, socialism, over-summative wholes, etc. This in contrast to the characteristics of 1400, 1775, 1860: aggregates, planless world, laissez-faire, hedonism, domination of feeling, etc. (Art.[1936], 27-29.) Compare these remarks with Howells': "The whole is modest; the part is exhibitionist....The whole impresses the introvert; the part impresses the extrovert." (HFW, 30.)

20. See below, 132-140.

21. GCB, 10.

experiment:

> Weder Mythologie noch Legenden sind in der Wissenschaft zu dulden. Lasse man diese den Poeten, die berufen sind, sie zu Nutz und Freude der Welt zu behandeln. Der wissenschaftliche Mann beschränke sich auf die nächste klarste Gegenwart.[22]

Nevertheless Goethe's lines in Faust seem to ask for the primacy "des schauenden Bewusstseins" or what Marvin Black called synopsis. Mephistopheles taunts the scientists:

> Wer will was Lebendigs erkennen und beschreiben,
> Sucht erst den Geist heraus zu treiben,
> Dann hat er die Teile in siener Hand,
> Fehlt leider! nur das geistige Band.

Many other scientists and philosophers might be mentioned as endorsing the organismic perspective.[23] Subsequently it will be shown how some central figures in the history of philosophy since the Greek cosmologists have been interested, directly and indirectly, in the nature of wholes and the methods appropriate to investigating them. Citations of some

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22. Goethe, SW, XXXIX (Schriften zur Naturwissenschaften. 1), 69-70. See ibid., 26-28 ("Erfahrung und Wissenschaft") for a lucid description of scientific method as it is actually practiced. Von Mises well protests an uncritical use of Goethe's name as a rallying-cry for anthroposophy and the "schaunden Bewusstsein." In the subsequent historical chapter there will be further reference to Goethe's methodological contributions.

23. Othmar Spann, the German sociologist, is an ardent exponent of the organismic perspective. In Tote und lebendige Wissenschaft (4-5) he writes: "Dies allein ist das Grundlegende, ist die Ur-Aufgabe aller gesellschaftlichen Wissenschaft: zu begreifen, was Ganzheit sei, und welcher vollkommene Gegensatz bestehe zwischen henem Verfahren, das aus einselnen Stücken ein (scheinbares) Ganzes zusammenstellen will, und henem andern, dem Ganzheit ein Erstes, das Erstwesentliche, Unableitbare (Primäre), alle Einzelheit dagegen nur abgeleiteter, gliedlicher Teil ist." (Quoted by von Mises in KLP, 322) Again, Aloys Wenzl, professor of philosophy at Munich, writes: "Es gibt in der neuen Atomphysik Gesetzmässigkeiten, die sich nur aussprechen lassen mit Bezug auf ein zusammenhängendes Ganzes, nicht mit Bezug auf die Element selbst, Ganzheiten also, in denen jeder Teil sozusagen auf anderen Rücksicht nimmt." (From Frank, EmP, 33.)

contemporary theories show the urgency and vitality of these issues.

In all the views mentioned thus far there was implied a difference between a "concrete" and "abstract" way of looking at complex things. The concrete way brings a reference to different forms of togetherness that distinguish wholes one from another and to the unique and irreducible properties a whole may have in contrast to its parts. The abstract way misses these features. In the end it tends to see all wholes as being merely parts-in-a-certain-order.

In all the views mentioned thus far there were methodological questions in the background threatening to become articulate -- the analytic dissecting method versus a "synoptic" method more adequate to wholes, questions about abstraction and elimination of data relevant to judgments about wholes, and the place of concrete intuition in comprehending wholes.

B. Direct Anticipations of the Dissertation Problem.

The various "holistic" and "organismic" philosophies discussed earlier only suggest the central problem of this dissertation. But there is a direct assault on it in the writings of Lewis W. Beck. Those writings are listed in the bibliography at the end of this dissertation.

The writings of Lewis W. Beck advance the problem of this dissertation in important ways.[24] He shows, in an effort to outline the unique features of synoptic method, how various claims for that method have been either too little, too much, or all together too indefinite. In criticism of Merz, Beck argues that it is not enough to regard "acknowledgement of an oversummative property" in a whole as being the unique contribution of synopsis. Such acknowledgement requires only an intuition or acquaintance. And that is not enough to tell us whether we have a whole and what kind it is. Further, Beck shows that our knowledge of wholes and parts requires experience and experimentation. In this he agrees with Spaulding that deductive logic is not sufficient.

But despite these valuable advances Beck's view of synopsis is not enough. He believes that it differs from and corrects Spaulding's analytic method of dealing with wholes. In Chapter III of this dissertation, however, you

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24. See below, 113-119.

will see that the main difference between Beck's "synopsis" and Spaulding's "analysis" is one of names.

B. Definitions.

1. Analysis.

Analysis is ordinarily taken to mean the resolution of any object into elements or parts. Inasmuch as it refers to the process of resolving as well as the results, analysis must entail a recognition of the relation of the elements to the original whole, i.e., it must include synthesis. If one analyzes a rose, he finds it to consist of thorns, stem, petals, seeds, leaves, sap, and so on -- all related in such a way as to insure growth and all with some unique and some common properties.

It is implied in the above definition of analysis that the object which undergoes analysis is not simple, indivisible, or completely a unit. For an object to be analyzable it must somehow be complex. In some sense it must be a whole. In the chapter devoted to analysis that follows it will be seen that there are different kinds of analysis. And distinctions as to kind rest on the nature of the analytical operations themselves or on the objects to which they are directed.

2. Synopsis.

Synopsis is usually defined in relation to analysis because it is said to embrace certain features of analysis and at the same time to have something more. If synopsis is not just another name for analysis, it must have a specific contribution of its own. If there is any more than a verbal difference between analysis and synopsis, there must be a difference of fact, i.e. those words must stand for determinable differences in the way of investigating wholes.

Etymologically, analysis means the understanding of anything by resolving it into its elements or parts; synopsis means understanding by seeing objects together. But in this simple sense analysis and synopsis imply one another and cannot be radically separated. In this simple sense synopsis is no more than synthesis -- the counterpart of analysis determined by direction of investigation. For example, the petals, thorns, leaves, and other parts of the rose are "seen together" in so far as they are known as parts. Moreover, designation of parts of the flower establishes its kinship with lilies, daisies, and the entire realm of flora.

For preliminary and introductory purposes synopsis may be defined as the procedure in which analysis-synthesis, as described above, is dominated by reference to the specific and unique whole with which investigation started and in

which it should terminate. "Dominated" means that the adequacy of analysis is tested by reference to the whole as starting point and that the results of analysis are interpreted by a similar reference.

The analyst tends to see a complex object as "nothing but" an expression or result of simpler terms and relationships. He seeks abstract simplicity. The synoptist, on the other hand, tends to see parts, elements, and relationships in subordination to the specific properties of the whole which give that whole under consideration its sui generis nature. He seeks explanation that is adequate to all the appearances and tries to avoid minimizing or explaining anything away in the interest of such generality and simplicity as may come from concentrating on parts-in-a-certain-relationship. These differences between synopsis and analysis, as well as the various implications of these differences, will be developed more fully in Chapter IV.

3. Whole and part.

The preceding definitions suggest the urgency of clarifying the term "whole." Every fundamental definition of whole is an echo of Plato's thesis that it is a complex unity: "A whole must necessarily be one made up of many; and the parts will be parts of the one, for each of the parts is not a part of many, but of a whole."[25] That is to say, a whole is not a unit but a unity of elements. It is a single thing but not simple, or, to use a phrase of William Stern, a whole is a unitas multiplex. Singularity, unity, or oneness and diversity, plurality, or manyness are equally implied in the notion of whole. A whole is an organization or system of elements. It is a togetherness of objects (here, any object of attention) seen as one. A human family is a whole. It is a specific organization of persons such as father, mother, sister, and brother with diverse and sometimes intrasitive relations among them.

The term "part" means, first of all, that which the whole contains, an element which is together with other elements to form the whole. For reasons which will be elaborated in the next paragraphs -- for reasons connected with the difference between wholes and aggregates, between the discrimination of qualities and the discovery of other objects within

25. Parmenides, 157. See ibid., 137, 166. (Jowett, DP, II, 127, 98-99, 139-140.) Cf. Eisler, WpB, I, 452-453; Krikorian, Art.(1935), 121; Beck, Art.(1939), 340; discussion of Plato below.

a complex object -- "parts" should be confined to objects which are the sufficient conditions of a whole's unique or specific properties. "Qualities" or "aspects" are appropriate labels for the separate properties that identify an object. The qualities or aspects of a brick are color, weight, shape, and smoothness. Its parts are sand, fibrous binder, and cement. Thus every part is an object, i.e. a complex or cluster of concrete qualities. (Whether these concrete qualities are subjective or objective -- epistemological idealism versus realism -- is a question which is outside the scope of this dissertation.) Since every part is an object, there are no simple parts. Every part is a complex of some concrete qualities or aspects. Only abstracted qualities are simple, and these can never be "parts" according to the above definition.

a. Types of whole.

In considering types of whole, it is advisable to review several classifications made by various writers and note the principle of classification, the implicit definition of whole, and some consequences of each grouping for the meaning of whole in general. A thoroughly adequate classification of wholes is really a metaphysical problem related to categories and modes of being. It requires a full-blown metaphysic. Here metaphysical problems are dealt with in so far as they are directly related to problems of method.

After remarking that "The whole signifies a pattern of elements and relations persisting through change," Y. H.

Krikorian, in an article entitled "The Concept of Organization," finds five major types of whole with a number of subtypes.[26] First, there is logical or mathematical organization. Here the elements form a "deductive whole" -- propositions and premises, axioms and theorems -- which awaits existential exemplification. The additive organization, "where the whole is the sum of its elements," is the simplest subtype of this group. A foot as the sum of inches is an additive organization.[27] Secondly, there is spatio-temporal organization. In spatial organization the whole is a unity of positions of the elements --e.g. a square or a triangle. In a temporal organization the whole is a unity of simultaneity or succession of elements -- e.g. the history of a nation. An event as "qualified space-time" is a projection from these more primitive types.[28] The third type, substantial organization, is a whole which is "a pattern of qualities persisting through duration of time." A "thing" like a book or chair illustrates substantial organization. Again, such organizations may differ in virtue of their persistence -- a mountain or a flash of lightning.[29]

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26. Art.(1935), 121. Krikorian makes "whole" an aspect of organization along with elements and relations. Thus, "organization" is the more inclusive notion. Nevertheless, when he analyzes the types or modes of organization, it is "in terms of different types of whole." The difference between organization and whole is apparently that the whole is "the pattern of elements and relations" and thus "is always one," whereas an organization is complex and itself includespattern. Throughout his article Krikorian does not always adhere to this precise distinction.

27. Ibid., 122.

28. Ibid., 122.

29. See ibid., 123.

Causal organization is the fourth type. Here a manifold of elements is related in terms of uniformity and correlations ("Fundamentally assertions of mutual implications"). For example, wind moves the branches, heat raises the column of mercury. Causal organization in turn has the subtypes of strict and statistical causality -- the difference being that in the latter the uniformity is only for groups. Purposive organization is the fifth type in which "there is a tendency, a common result of a type which is usually, though not always, accomplished." In view of the inclusion of accomplishment and tendency, purposive organizations are related to feelings of pleasure and displeasure, or rather, purposive wholes include them as functions of accomplishment. This type is exemplified by a work of art, a living animal, a personal mind, and a society.[30]

In his "Defense of Analysis" in the co-operative volume, The New Realism, Spaulding offers a classification whose form is substantially retained in his subsequent writings. Since Chapter III contains a detailed examination of his views, it is necessary here only to sketch this classification and notice the principle of its order. "The whole," says Spaulding, "is the parts and their properties and the relations relating the

30. Krikorian, Art.(1935), 124. The important consequence of this theory of organization is that since there are different levels of organization, accurate prediction depends on "a more thorough empiricism," and prediction will increase "as our experience increases and as our knowledge of empirical laws increases." (125) Further, unless organization is additive, its properties described distributively are not the same as those described collectively. Thus, a violin, watch, oil painting, considered distributively is physical, chemical, or mechanical; considered collectively each shows purpose.

parts and the possibly specific properties of the whole."[31] Since a whole is elements (terms, parts, or individuals are used by Spaulding as synonyms) in relations, wholes may best be distinguished from one another by the type of relationship that holds among the parts. First, there is the aggregate or collection in which components are linked only by "and." "Anything, taken with at least one other 'something,'" says Spaulding, "and these two with another something, and so on, form a whole."[32] The universe is a whole in at least this sense: an aggregative totality. Such a whole, Spaulding remarks, has no distinctive properties as a whole.

In the second type of whole the individuals have, in addition to conjunction, similarity and sometimes ordering-relations so as to form classes. In The New Realism Spaulding includes in the notion of class relations generating order--symmetrical and transitive relations and their opposites. This grouping is broken down in The New Rationalism where he distinguishes between classes and series.[33] In any case, the next general type of whole above aggregate is the class in which either individuals or other classes are united and ordered to form such wholes as space, time, and carbon or element and number. The highest type of whole is the organic whole. Here there is a complex of elements "which, related, do modify or

32. Spaulding, Art.(1912), 163.

31. Ibid., 161.

33. 192-194. Cf. Art.(1912), 167-170.

influence one another, or which perhaps are constituted by virtue of their relation to one another."[34] Living things and physical objects exemplify such wholeness. These, like the wholes of space and time, have properties not additively derived from the parts. The specific relationships that distinguish organic wholes are complex causal and purposive relations among elements.[35]

The only type of whole which elicits Wilhelm Burkamp's interest in Die Struktur der Ganzheiten is one which at least fulfills Ehrenfels' criterion for Gestalt:

> "Gestalten" nennt man nach von Ehrenfels diejenigen psychischen Zustände und Vorgange, deren charakteristische Eigenschaften und Wirkungen aus artgleichen Eigenschaften und Wirkungen ihrer sogennanten Teile nicht zusammensetzbar sind.[36]

Following Othmar Spann, Burkamp defines whole in terms of the emergence of oversummative properties and believes that whole and sum are opposites: "Ganzes oder Ganzheit ist nicht die Summe der Teile, sondern mehr als diese Summe, ja etwas gründsätzlich Anderes."[37] Burkamp is anxious to stress the "Eigendeterminierheit der Ganzheiten" and by this he means that a whole has certain unique and irreducible characteristics. His views at this point may well be compared with Spaulding's position on organic wholes. On the basis of the above distinction

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34. Spaulding, Art.(1912), 240. See TNR, 500.
35. See below, Spaulding on "organic wholes," Chapter III.
36. Köhler, PG, ix. Burkamp, SG, 68.
37. SG, 50 from Spann, Kategorienlehre, 86.

Burkamp finds two main types of whole: autotaktisches Ganzes and menotaktisches Ganzes.

An autotactical whole is a changing whole, a closed causally determinate process. Its structure determines the order of changes. Here the emphasis is on self-determination and closed system but yet change. The more significant and fruitful notion is that of menotactical whole. Here the dominant note is repetition. The repeated and perpetual recurrence of a given structure guarantees the whole's continued existence.[38] Under normal circumstances the whole's condition is determined by the recurring structure. Burkamp finds that the earth, planetary system, a flame, a living cell, and an organism exemplify menotactical wholeness. Under this somewhat vague and general class are subsumed the notions of Wirkungsganzheit and telisches System. As Burkamp says: "Man kann auch jege menotaktisches Strukturierung als solche als Telie auffassen....Man könnte Menotaxis auch als Menotelie beziechnen, da das Bleiben als solches Ziel ist." "Telie" itself needs further explaining: "Unter einter Telie oder einem telischen System verstehe ich allgemein ein dienliches Ganzes....Dienlichkeit der Wirkung ist ein wichtiges Motive, Zusammenhänge als Ganzes aufzufassen."[39] Burkamp, like Kant, stresses "conformity to purpose" and goal-seeking -- not necessarily the conscious entertaining of an intended goal -- as an essential

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38. See Burkamp, SG, xv-xvi, 88ff.

39. SG, 88, xvi; 102-103. In the last quotation the "purpose" is close to what Hegel called external or finite purpose.

mark of wholeness. Especially is "conformity to purpose" necessary to complete the notion of Wirkungsganzheit. In a biological unity or a machine there is almost always a purpose-unity, Burkamp believes. "Direction" in productive results or organization of material is patent evidence of teleological unity. Furthermore, the notion of optimum or ideal performance shows the need for purposive categories in organisms, machines, or even cultural groups.

b. Comments on the definition
and types of whole.

1) Wholes and sums in relation to specific or unique properties. Of the common features in the preceding classificiation one stands out as noteworthy -- the contrast between whole and sum, or the difference between aggregates and what are often called "real" wholes. This difference is found in Krikorian's classification of additive organization as the lowest form and one which is often the source of problems and confusions when philosophers take it, mistakenly, as the model of all wholeness.[40] Again, Spaulding classifies a sum or aggregate as a whole but makes this caution:

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40. See Krikorian, Art.(1935), 122.

> A whole may be a mere aggregate notwithstanding certain other relations, such as those of similarity and difference, among its parts. Such a whole, however, does not seem to possess any distinctive properties as a whole; it is simply its parts, with their properties, summed and numerically conjoined.[41]

Amplifying the general Gestaltist thesis, Wilhelm Burkamp believes that whole and sum are almost opposites. He stresses the "Eigendeterminierheit" or uniqueness and irreducibility of certain properties of the whole.[42] What is the basis for distinguishing whole and sum? In the above quotation Spaulding has given valuable hints as to where to look.

When a complex object is treated as a sum, the investigator pruposely considers only its plural parts-in-relation. Its unique properties, properties over and above those of the plural parts or elements brought together, are ignored or are actually not present. The difference between the unique properties of a whole and the properties of its various parts is well illustrated in a given human society. The unique properties of a society, as a whole, are various customs, folklore, and, more specifically, institutions like private property or a state religion. As to the properties of the parts, there are men with particular and various racial characteristics, a particular environment that conditions human activity, persons with and without land, and individuals in whom religion may be a matter of etiquette or an intense experience.

Viewed as one and whole, an automobile is capable of travelling at the rate of eighty miles per hour. It has such

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41. Spaulding, Art.(1912), 164.

42. See above, 20.

and such a horsepower. It is marked by a certain amount of streamling to take care of wind resistance. And under normal usage it will probably last a calculable average number of years. Yet the sparkplug has neither horsepower nor speed. Nor do the bearings on the crankshaft have such properties. The sparkplug's most important characteristic is its durable points (of the right kind of metal) at a certain distance from one another. This important distinction between the unique and specific properties of the whole in contrast to the properties of the parts applies even to philosophical systems. In describing the method of the historian of ideas, A. O. Lovejoy notes that

> Most philosophical systems are original or distinctive rather in their patterns than in their components.... Just as chemical compounds differ in their sensible qualities from the elements composing them, so the elements of philosophical doctrines, in differing logical combinations, are not always readily recognizable; and, prior to analysis, even the same complex may appear to be not the same in its differing expressions, because of the diversity of the philosophers' temperaments and the consequent inequality in the distribution of emphasis.[43]

In any whole the specific, unique, or "oversummative" properties are the unitary aspects of the whole. They are the properties that belong to it as one in contrast to the plural parts and their properties which the object in question has or may be found to have. The various parts with their properties emphasize the plurality of the whole. In the previous definition it was said that a whole is a <u>unitas multiplex</u>, a oneness and diversity at the same

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43. GCB, 3-4.

time. Such statements must have read strangely like contradictions, like saying a thing is at once one and not-one. There is no formal contradiction when it is seen that a thing is one and many but not under the same aspect or from the same point of view. When an object is a whole, it has certain properties that belong to it as one thing, as a unity. It also has certain properties distributively, with reference to the plural elements which are unified and organized.

In his article entitled "Synoptic Method" Beck has dealt with this problem in an attempt to find the meaning of "real or objective whole." He asks, how can one distinguish between the whole that is formed of one's head and his body, and the whole formed by Carroll's cabbages and kings? The usual answer, Beck notes, is in terms of "oversummative" properties.[44] This answer does not satisfy him. Referring to a discussion of the matter by Charles Peirce, Beck maintains that any two objects when taken together have a property which neither possessed alone and no other object has in common with them. A and B in a sum have the unique property of un-A-B-lessness. This symbolic example might well be supplemented by the more concrete conjunction of cabbage and king or dog and apple. But the principle is the same. Beck infers that the new property in a sum is logically on a par with a Gestalt quality.[45] There may be a certain formal or

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44. Art.(1939), 340-341.

45. Ibid., 341. Cf. Burkamp, SG, 65.

purely "logical" parallel with the more advanced forms of organization, but there is an important difference. In the examples used by Beck there are no unique concrete properties that mark the unity or "Eigendeterminierheit" of the whole. To specify the nonlogical and concrete properties of an aggregate the investigator must always indicate the elements -- A and B, cabbage and king. It must now be apparent that sums and aggregates satisfy the previous definition of whole only superficially. The distinctions brought out here underline Moritz Schlick's remark that the problem of wholeness is first of all a problem of definition.[46]

Because a whole which is more than an aggregate is thus a unity with certain unique and irreducible properties, an adequate method for dealing with wholes must take sufficient account of those unique properties. An inadequate method will try to explain them away or discount them. It will ignore their importance in understanding a given whole. In this respect a falsifying method may convert all wholes into sums or try to minimize the special properties the whole may be found to possess. Dewey suggests the canons of an adequate treatment of wholes in his critique of elementarism: Elements depend on the existence of immediate and qualitatively integral objects (Compare with the unique or specific properties of a whole mentioned above.). The search for elements starts with empirical objects possessed as integral and "Every step of analysis

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46. See Art.(1935), 54-55. The question of whether an organism, a community, or an electrical field in a wire is a whole or sum has no meaning until one has settled as to when and how he wants to speak of wholeness.

depends upon continual reference to these empirical objects."[47] Only in such reference do cells, electrons, and the like have their empirical and functional meaning. Thus Dewey has hinted that an adequate treatment of wholes is one in which the unique and specific properties are not explained away or reduced to properties of parts. Rather, they are the primary datum and subject-matter which parts, elements, and organization are to explain.

2) Qualities or aspects in contrast to parts. What is the relationship of the unique and irreducible properties of a whole to those of parts? That depends, as was suggested earlier, on what you mean by parts. In the previous paragraphs parts and wholes were treated as being in distinctly different universes of discourse, e.g. a society characterized by certain institutions in contrast to particular men doing specific tasks. That meant, of course, that the unique features of the whole and parts do not strictly or formally imply one another. Rather, the movement in each direction is by hypothetical inference. It is an act of discovery like the finding of causes. "The discovery of parts from wholes and of wholes from parts," writes A. C. Benjamin, "is essentially imaginative in character, guided, as in the case of causal inferences, by loose analogies."[48] Thus explanation of a whole is a search for the sufficient conditions of its unique properties in terms of the organization

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47. EN, 144.

48. IPS, 193-194. See ibid., 205.

of other objects or things with their own properties. The automobile and all that is meant by "automobileness" is explained when one comes upon sparkplugs, cylinders, crankshaft, body, paint, and so on -- all organized in such a way that mobility and a certain horsepower are the result. Again, a society is explained by the diverse organization and activities of the specific individuals and their conditions of life. Only in reference to the unique features of the whole as a whole, to its specific and unique properties, can you discover that some other objects are parts, i.e. sufficient conditions of the whole's specific properties. And only in reference to the unique features of the whole as a whole can you test and verify your discovery of parts. The parts, it has been frequently said above, are other objects organized in a certain way. They are thus the sufficient condition for the whole having the specific properties that it does have.

A whole, however, may be "explained" by concentrating on its own apparent properties, by a conceptual analysis of those properties. But then the "parts" are not of the same sort as those described above. For clarity they should rather be called qualities or aspects. Plato was referring to qualities or aspects when he wrote in the Theaetetus that "wholes" are built up of simple elements with which you are directly acquainted:

> None of these primeval elements can be defined; they can only be named for they have nothing but a name, and the things which are compounded of them, as they are complex, are expressed by a combination of names,

> for the combination of names is the essence of a definition.[49]

The qualities or aspects of a brick are its weight, solidity, shape, and so on (these may or may not be primitive), but its parts are sand, binder, cement, and coloring matter. The explanation of an object in terms of its qualities or aspects, however, is quite different from explanation through the finding of its parts. The first method of explanation deals with the object as a complex of concrete qualities rather than a whole containing parts. Accordingly, in Spaulding's classification of wholes the parts of organic wholes -- physical and chemical processes, cells, and electrons -- are not on a par with the "parts" of space and time which, rather, are qualities or aspects. It is important to distinguish analysis into qualities or aspects from analysis into parts. The former is primarily a conceptual act requiring only a clear and distinct grasp of features. The latter requires imagination, hypotheses, and all that goes along with experimental reasoning. It requires the "experienced union" of events, to use Hume's phrase.

The clear and distinct grasp of features, qualities, or aspects provides a common sense description of the object under consideration. Thus, a brick is described as a box-like, heavy reddish, rough, solid physical object. Naturally this description involves a discrimination of qualities or aspects within the qualitatively integral object. Insofar as the moments or aspects are taken as data for inferences to parts, the description of the whole in question may be expanded as discoveries are made. So other objects with specific relationships and qualities of their own, i.e. the sufficient

conditions of the properties of "the whole as a whole," may sooner or later enter into its description. Only then will the properties of a whole stridly imply the parts' properties and relationships.

It is clear that the specific and unique properties of a whole may be terms in an off-hand, commonsense description of the whole. Or they may be data for inference to their own sufficient conditions, for inference to parts proper. The latter would seem to be the only way whereby parts (and not merely abstracted qualities or aspects) can be discovered with their own properties in distinction from the specific properties of the whole. The method ofanalysis into qualities (conceptual or mental discrimination) treats the object more as a complex of concrete qualities than as a whole of parts, strictly speaking. It is analysis which arrives at elements that Loewenberg has called "post-analytic data," i.e. terms in the primitive description of a unitary object which is a complex of different data (simple characters and nonsensible modes of organization involving unity, identity, and so on.)[50]

3) Unities of qualities or aspects and analysis into qualities. Of the three preceding classifications of wholes Krikorian's is most satisfactory because it provides more explicitly for the distinction between a whole as a complex of qualities and a whole as a unity of objects, thus providing for the fact of unique (Gestalt or "oversummative") properties in a whole. It will be shown later how this is implicit in Spaulding's contrast between analysis in situ and experimental

50. See above, 28. Cf. Loewenberg, Art. (1927), 7-8.

analysis and in his statement that he is not attempting to derive everything from one kind of brick.[51] Before looking to Krikorian's classification as a basis for a critical and synthetic classification of wholes, one should note a feature that belongs to all groupings regardless of specific distinctions as to the nature of elements or parts that are unified. Since a whole is a unity, organization, or togetherness of parts, its form or mode may be considered in abstraction. Krikorian suggests this possibility in contrasting abstract and concrete wholes.[52] In any whole the mode of unity is a pattern which may be treated abstractly. Whenever the pattern among elements in a whole is found to be specifically exemplified by concrete experienced events (constants), there is an actual whole of the type under consideration. Boyle's law for the pressure of gasses, when it is considered exclusively in symbolic form, is thus an abstract functional whole. The same principle applies even to purposive wholes whose telic (means-end, aiming at a type or norm) relationships may be considered apart from concrete events. This distinction is made in Blanshard's theory of the idea:

> When we speak of the relation between idea and object as that of unrealized to realized purpose, we are speaking of what may be called the essential or logical aspect of that relation, <u>not</u> of the temporal lapse of process through which we come to know it.[53]

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51. See WC, 222.

52. See Krikorian, Art.(1935), 121.

53. NT, I, 517. Cf. ibid., 473. This is Kant's distinction between formal and material conformity to purpose which cuts across the distinction between art -- subjective conformity to purpose -- and natural organizations. KU, 274-275, 32-34.

Krikorian's classification, as mentioned before, breaks in the middle as he introduces things or substantial wholes which are enduring patterns of qualities.[54] Before he introduces "things" there are only "wholes" to be dealt with by analysis into qualities or aspects. The "parts" of such "wholes" are not "objects," as defined earlier. Rather they are abstracted and simplified qualities. In this category fall space, time, and perhaps classes themselves. But these are not wholes in the same sense in which a human body, an automobile, a brick, or a society are wholes. If one believes space and time to be complex, he might subject them to a conceptual analysis or what Spaulding calls analysis in situ. He would find them to be a pattern or complex of qualities. By a mental analysis he would make his meaning more definite and clear. But he would not find "parts," i.e. other objects with their own properties. Furthermore, it is doubtful whether a class should be called a whole. Because a class embraces or denotes a number of objects one might think it is a whole. But a class is formed by separating out common qualities or properties in different things. It is a result of mental analysis into qualities. Of itself a class is a property or group of properties. Though objects may be instances of a class, they are not "parts" according to the meaning used here.

4) Functional wholes. Spaulding's organic wholes, Krikorian's causal and purposive wholes, and Burkamp's functional wholes (Wirkungsganzheiten) all presuppose parts that

54. See above, 17.

are more than qualities or aspects. They presuppose a unity or organization ofobjects, what Krikorian called substantial wholes, as the sufficient condition of the unique properties of the "whole as a whole." They presuppose a whole whose investigation requires more than conceptual discrimination of qualities or aspects. Hence the"terms" of a spatial whole are not on a par with the "terms" of such a whole as a molecule or a human body.

The wholes referred to in the paragraph above -- wholes which specifically differ from aggregates or sums -- may be grouped under the general notion of functional whole with a lower subtype, the causal whole, and a higher subtype, the purposive or telic whole.[55] This means that the dominating mode of organization among the parts is the functional relationship. The term "function" is used here much in the same way as Whitehead uses it. In a functional whole the parts or elements change, influence, and determine each other.[56] The mathematical physicist makes the causal relation a functional one so as to facilitate measurement and computation. For him a function is a magnitude so related to another that to values of the former there correspond values of the latter. In any

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55. The central problem of this dissertation does not require an exhaustive discussion of the hierarchy of wholes. That is a significant and difficult metaphysical task deserving treatment in itself. The present synthesis is advanced especially to show that wholes of different types require special modes of comprehension and investigation.

56. See PR, 38.

case, there is reciprocal determination. Examples of this type of wholeness are a modern automobile, a molecule, or a solar system. A causal whole subsists only so long as there is a clustering or concentration of functions greater in number than the functional relationships to an environment.[57]

The highest type of wholeness is the telic whole which is at once a functional and causal whole but something more. The functioning of some parts is dominated and determined by the value of others. For example, the growth of the human eye and the development of the double heart system in mammals involve something more than causal and functional interdependence: "Phylogenetic and causal references alone can never give us a complete story of what happens in this, or in any other embryonic development. The reference to 'purpose' is unavoidable."[58] There is, then, in a telic whole a hierarchy of parts functionally related. They seem often to stand in means-end relationship. A purposive whole, Krikorian observes, involves aspects of realization and achievement related to "accomplishment of tendencies."[59] In this case the unifying characteristic of the whole is the interplay of purposive processes which presuppose functional and causal organization and unitary objects as parts themselves amenable to conceptual

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57. See Beck, Art.(1938), 372-373 on the criterion of inhomogeneity, i.e., the categories which apply to the insides of a thing at a given stage of inquiry differ from those that apply to its outsides.

58. Werkmeister, APS, 333-334. See ibid., 349-351, 362.

59. See Art.(1935), 124.

discrimination. Examples of this type of whole are an amoeba, a dog, a man, and a personal consciousness.[60] A telic whole, as defined above, is properly an organic whole though "organic" is frequently used much more extensively. Organic whole has its obvious prototype in the actual living thing and its structure. Even here there are degrees of wholeness ranging from the not-so-complex amoeba to the human personality and mammalian body. Here, of all places, there is the highest degree of self-maintenance, complexity, and tight togetherness of parts.

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60. See above, 21, the grounds for Burkamp's view that any Wirkungsganzheit is telic. Hegel has well suggested, in the opening paragraph of his Naturphilosophie, that purely external teleology is a gratuitous anthropomorphism that rarely helps science or religion. The above examples of purposive wholeness require a further caution: In this dissertation there is deliberate abstraction from the relevant metaphysical question of the human self's organization and unity through purpose, a question raised by Hume, among others, when he sought a source of identity and persistence of personality in a more empirical basis than substance. (See THN, I, 243ff.) Here there is also abstraction from issues suggested by Kant's contrast of an organization's conformity to purpose with and without purpose, issues such as conscious and unconscious purpose and the regulative ("as if") nature of teleological judgments. These are important issues, but they are not at the center of the dissertation.

D. Summary and Conclusions.

"Organismic" or "holistic" philosophies have recently gained prominence. They use scientific results such as the physical field theory and Gestalt psychology to support philosophical theories saying that the world's ultimate elements have a structure something like that of a living thing. Views like those of Smuts, Whitehead, Lossky, and others indirectly suggest that there is a "concrete" way of investigating a whole that does justice to its unique properties and organization, and there is an "abstract" analytic way that tends to miss those features and find a mere aggregate.

Such views raise the central problem of this dissertation: Does the understanding of wholes require both analysis and synopsis? The question implies that there is a difference between the analytic and synoptic methods. To find this difference the dissertation examines views of men who say they use analysis or synopsis in order to understand wholes of various kinds. (The writings of Lewis W. Beck advance this problem in important ways. He shows that synoptic method must be something more than "acknowledgment of an oversummative property and that knowledge of wholes must be empirical rather than purely "ratiocinative.") But first there must be a tentative definition of basic terms, and the meanings of "whole," "sum," "part," and the like must be made clear.

Analysis ordinarily means resolution of an object into parts and also recognition of the relationship of the parts to the original whole. Etymologically synopsis means seeing things

together. In this simple sense it is merely analysis-in-reverse or synthesis. So, for the various reasons to be given later, this dissertation presents the idea that synopsis is the procedure wherein results of analysis-synthesis are tested and interpreted by reference to the specific and unique properties of the whole in distinction from those of the parts.

1. Conclusions about types and definition of whole.

A whole, to paraphrase Plato's definition, is a unity of elements or a togetherness of objects seen as one. Satisfying this broad definition, wholes have been defined by various writers as ranging from "additive organization" through spatio-temporal wholes" to causal and purposive organizations (Krikorian, Spaulding, Burkamp). When a complex object is treated as a sum or aggregate, the investigator deliberately sees only its plurality and speaks of the whole in terms of that plurality. The object is then characterized exclusively with reference to the properties of the parts conjoined with each other. Specific and unique properties of the whole are ignored or are actually not present. Because some complex objects are aggregates but also <u>something more</u>, they have specific and unique properties, properties that are more than transcriptions of features of the parts. The existence of such properties explain how a whole can be called both a unity and a plurality. The unique properties of an automobile -- its speed, horsepower, and social use -- mark it as one in contrast to the plurality and relations of parts such as sparkplugs, pistons, fan, and wheels.

"Parts" of a whole are such objects as are found to be the condition of the whole's unique and specific properties. "Parts" should not be confused with qualities or aspects which, taken together, constitute any given object. The qualities of a brick are its brown color, box-like shape, and smooth surfaces. Its parts, however, are sand, fibrous binder, and cement in a certain arrangement. Thus spatial, temporal, or "substantial wholes" in themselves are to be seen as complexes of various qualities or aspects. But in a "real" or functional whole the parts are more than qualities or aspects. Such wholes are an organization of objects or processes found empirically to be sufficient conditions of the whole's specific and unique properties. There may be, among the changing parts and internal processes, causal and purposive relationships (in the latter case the functioning of some parts is dominated by the value of others). A machine, a molecule, an amoeba, and a human personality are obvious and familiar examples of a "real" or functional whole. Moritz Schlick has well suggested that the problem of wholeness is first of all a problem of definition.

The important and central question is whether both analysis and synopsis are required to deal with wholes which have certain properties that are "qualitatively different" from the properties of the parts and their arrangement.

2. Prospectus.

The title of Chapter II, Questions About Wholes and Methods Arising From the History of Thought, should be taken quite literally. That chapter will consist of a brief review or sketch whose purpose is to examine problems about wholes and the way of comprehending them -- problems growing out of the ideas of a few salient personages in the history of philosophy.

Chapter III will consist of a thorough examination of the analytic method as it is defended by Spaulding and Perry. In that chapter the different types of analysis will be considered, and there will be reference to the type of analysis championed by logical positivists. Why will analysis be taken up with close reference to the views of specific men? First of all because the analytic realists such as Spaulding and Perry have most ardently defended, championed, and written at length about the analytic method. Secondly, because philosophical discussion and polemic is often confused by an attack on positions that no one does or would hold. There cannot be a clarification of meanings that will enhance common discourse unless one pays attention to what other people say.

Chapter IV will consist of an examination of synopsis with an attempt to find wherein the uniqueness of its procedure might lie. This chapter is the heart of the dissertation. Historical as well as important theoretical considerations make it necessary to link the method of synopsis with analysis-synthesis in order to determine what should be contributed by synopsis for adequate comprehension of wholes. Here again

views of specific men will be introduced as a springboard for critical discussion.

Chapter V will carry over conclusions from the previous chapters to an examination of the results and methods of science. Here especially will the question of scientific method as analysis be related to synopsis. Similarly certain methodological developments in connection with biology and psychology will be related to the synoptic procedure.

This chapter opened with examples of the contemporary interest in "holistic" philosophies and "synoptic" method. Those examples should have been evidence enough of the need for critical analysis. A thoughtful reader must feel that there is too much vague generalization and not enough patient inquiry into the grounds and consequences of "holistic" method and the intellectual atmosphere of this era. What seems to be needed is an attempt to winnow wheat from chaff.

From the outline of the dissertation's program it should be apparent that the writer must rely frequently on the conclusions of natural scientists. Their methods of investigating and conclusions will also play into the discussion. Here the writer can pretend to speak only as an amateur. But even the amateur can improve his standing by trying to rely, cautiously, on the views of men who seem to be authorities in the fields of physics, biology, and psychology. That will be done wherever it is possible.

CHAPTER II

QUESTIONS ABOUT WHOLES AND METHODS ARISING FROM THE HISTORY OF THOUGHT

The old adage that there is nothing new under the sun applies to most philosophical issues and ideas that are of interest today. The problems raised in the previous chapter -- the nature and kinds of wholes and, especially, the appropriate ways of investigating them -- are no exceptions to this truism. Like most current intellectual questions these have a long history beginning with the Greeks. A sketch of this history, referring to outstanding figures and issues, will set problems for later chapters.

A. Pre-Socratics.

If Aristotle had been entirely right about his predecessors, one could expect from them the sort of information about wholes that a materialist or physicist is able to give. The weakness of Thales, Anaxagoras, Socrates, and even Plato was, according to Aristotle, their neglect of all but material and formal causes. With obvious exceptions taken for granted, Aristotle's judgment seems generally correct. In the eyes of the pre-Socratics all wholes were ultimately material or physical complexes.

Thales found water to be the principle of all things. And though he also believed that everything is full of gods, it

is possible that he may have meant by "god" nothing more than water. Dissatisfied with his associate's theory that the material cause and first element of everything is water, Anaximander of Miletos advanced a more radical thesis: physis, or eternal and "widest" substance, is the fundamental reality.[1] Anaximenes, an "associate" of Anaximander and a member of the Milesian school, was not satisfied with an indeterminate, boundless physis. The one infinite substance was seen to be air. This thesis was supplemented by a theory of rarefaction that brought all changes under a quantitative principle.[2] Heraclitus thought of fire as the first principle of the world. Fire was chosen to reconcile flux and stability, the many and the one. Heraclitus saw the world as a unity of multiple factors: "It is just the 'opposite tension' of the opposites that constitutes the unity of the One."[3]

Aristotle and Plato interpret Xenophanes' denial of human attributes to a god who is one and the greatest as anticipating the One or Plenum of Parmenides. By "one god" Xenophanes probably meant that there is "No god but the world."[4] Writing his philosophy in meter, Parmenides maintained that the universe is a plenum which does not change, for change is an illusion of the senses. He showed that corporeality (which is sensuously perceived) and monism are incompatible and thus made

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1. Burnet, EGP, 54. See ibid., 47-48, 50-54; Aristotle, Met., 983.
2. Ibid., 73-79.
3. Ibid., 143.
4. Ibid., 127-128. See Aristotle, Met., 986b; Plato, Soph., 242.

the atomism of Democritus and Leucippus inevitable because the Greeks could not conceive of abandoning corporealism at this historical stage.[5]

Empedocles, another verse-writing philosopher, sought to explain the possibility of motion by having Strife and Love unite and separate the four basic elements of the world -- earth, air, fire, and water. Now the lines are clearly drawn between the pluralists on the one hand and Parmenides on the other.[6] Like Empedocles, Anaxagoras was a pluralist, but he had a much different conception of the "elements." Every "seed" was thought of as a unity of diversity,[7] and the Nous was understood as the source of separation and definiteness. "All things together" does not change, but there is mixture and separation. The substantial whole of being in Anaxagoras' thought stands in contrast to the flat and relatively simple monism of Parmenides.

In general, the interest of the early Greek philosophers was in the nature of being. While they found all things to be reflections of a certain type of cosmic wholeness, they were relatively inarticulate about the instruments they were using. To be sure, formal dialectic was used by Parmenides, but there was no detailed interest in methodology such as is found in Plato or Aristotle.

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5. See Burnet, EGP, 175-180. See ibid., 334-336 on the atomism of Leucippus and Democritus.

6. See ibid., 231-232; 207 (fr. 17); 215 (fr. 71).

7. See ibid., 263-264; 259-260. Cf. Plato, Phaedo, 98 (Jowett, DP, I, 482.)

B. Plato and Aristotle.

In the Parmenides Plato considers a question raised in the previous chapter: How can a whole be both one and many? At first Parmenides forces Aristoteles to admit that the one cannot be a whole and have parts. If it remains one, it is unlimited and formless and changeless. Since every mode of being is thus denied to the one, it is really non-existent. Then Parmenides shifts ground to show that the one has parts -- one and being -- and this is a whole. On this basis Parmenides seeks to show that the whole is, without contradiction, an ultimate categroy and that everything participates in the one.[8]

Discussion of wholes in the Theaetetus is related more directly to methodological matters. First Plato affirms that "a whole, though formed out of parts, is a single notion different from the parts."[9] Here is the suggestion that a whole may have certain unique and specific properties that are qualitatively different from the properties of the parts in a certain arrangement. As the dialogue moves on, however, this distinction is erased. A whole is identified with the all or a sum in order to show that if syllables, for example, are known, letters cannot be unknown.[10] The main intent of

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8. Parm., 137, 143ff., 156. Here the term "part" has a very special meaning. It means something even more abstract than the qualities or aspects which are found by conceptual analysis to be components of an object. Further, it is used in a totally different sense than the way hydrogen and oxygen are taken to be parts of water or the stomach is taken to be a part of the human body. Here "parts" are concepts or logical terms of different extensions: i.e., "being" includes "one."
9. Theaet., 204.
10. Ibid., 205E.

Plato's reference to syllables as wholes is to show that, in addition to expression of meanings or citation of distinguishing characteristics, explanation may be taken as "an enumeration of the elements out of which anything is composed." Plato uses the example of a wagon:

> He who can describe its essence by an enumeration of the hundred planks, adds rational explanation to true opinion, and instead of opinion has art and knowledge of the nature of a waggon, in that he attains to the whole through the elements.[11]

This concrete example -- the wagon and its planks -- is somewhat misleading, for planks are not elements in the same sense as the "primeval elements" referred to in previous remarks on Plato.[12] In speaking of "primeval elements" which "have nothing but a name" Plato means the qualities or aspects of an object rather than parts of a whole. He is concerned with the results of conceptual analysis of an object into its component qualities. Though in practice the letters of a syllable, Plato admits, are "more clearly known" than the whole syllable, the knowledge is of a different kind from a rational insight. Thus, a possible meaning of "explanation" is what was previously referred to as conceptual analysis in which the "parts" of an object are abstracted qualities or "primeval elements" which have "nothing but a name."[13]

Plato's "dialectical reason" is often linked with the synoptic method.[14] This is natural because Plato, in the

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11. Theaet., 207.
12. See above, 27ff.
13. See Theaet., 201-202.
14. See Rep., 537C. Cf. Merz, HET, III, 103-105, 193, 350n; IV, 430ff. Sorley, MVIG, 250; Brightman, ITP, 27-29.

Republic Plato says that the dialectical thinker is synoptical. On the level of "understanding," says Plato, the mind uses hypotheses in connection with images and "shadows." This is the province of geometry and the cognate arts. Then he goes on to describe the function of reason:

> When I speak of the other division of the intelligible you will understand me to speak of that other sort of knowledge which reason herself attains by the power of dialectic, using hypotheses not as first principles, but only as hypotheses--that is to say, as steps and points of departure into a world which is above hypotheses, in order that she may soar beyond them to the first principle of the whole.[15]

There are two sides of Plato's "dialectical reason." First, he suggests that all explanation involves reference to the system of Ideas and ultimate rational principles. Secondly, he suggests that inquiry should be guided by reference to the whole, by reference to the first-seen "unity of things." Is there here a sufficient differentia of synopsis? How is explanation through simple elements, which was taken up in the previous paragraph, related to analysis and synopsis? These are leading questions for the next chapters.

Corresponding to Plato's "dialectical reason," Aristotle's creative or active reason is that form of apprehension in which thought and object are one.[16] Among the soul's cognitive activities creative reason is highest. Like Plato's "understanding," the passive reason may be connected with sensuous and perishable images. Creative reason, on the

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15. Rep., 511. See ibid., 537C on dialectician as synoptist. Cf. Statesman on relation of the first-seen "unity of things" to enquiry in the arts, 285.
16. Aristotle, De Anima, 430a.

other hand, is really a divine form of cognition, for God's activity consists in pure contemplation admitting no distinction between subject and object, no images and desires. Whereas human intellect is discursive and human knowledge is piece-meal, God's thinking is intuitive in that he sees all things at once and whole.[17]

God's mode of cognition, says Aristotle in Nicomachean Ethics, is the moral aim of all men especially realized by the philosopher. The highest of the virtues are the intellectual virtues, for even moral virtues depend on the practical intellect.[18] Of the intellectual virtues the most important is philosophic wisdom which combines scientific knowledge (rational demonstration) with intuitive reason (grasp of first principles). The philosopher of all men tries to grasp the first principles of all things and demonstrate what follows from them -- the philosopher, then, is dearest to the gods.[19] It appears that there is little difference between Plato's dialectical reason and Aristotle's intuitive and creative reason. Especially do Aristotle's views raise the question of the relationship between the piece-meal understanding (emphasizing analysis) and intuition (creative reason) in comprehending wholes.

For dealing with the "phenomena presented by animals and their several parts," Aristotle's methodological dicta

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17. See Met., 1075aff.
18. See Nic. Eth., 1143b., 1145a.
19. See ibid., 1179a.

anticipate Kant, Goethe, and even contemporary "holists" who maintain that certain types of wholeness -- especially functional purposive wholes -- require a method of investigation that is somehow guided by a reference to the whole as "first-seen." Aristotle put the issue squarely:

> Ought the writer who deals with the works of nature to follow the plan adopted by the mathematicians in their astronomical demonstrations...or ought he to follow some other method?[20]

In answering this question Aristotle everywhere aimed to "save the appearances." Dealing with purposive functional wholes, he would not condone the reduction of final causes to material and efficient causes.[21] It seems accurate to say that Aristotle believed comprehension of wholes demands interpretation in terms of the collective, unique, or "first seen" properties as defining characteristics. Are the suggestions arising from Aristotle's remarks on creative reason or from his effort to "save appearances" the sufficient differential of synopsis in contrast to analysis? The answer must wait until the next chapters.

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20. De Part. Anim., 639b. While metaphysics along with physics and mathematics as theoretical sciences of "what is," start from eternal verities, in natural science and biology the consideration is what is to be. (See Met., V, 26, 1023b) "The artist, on the other hand," Aristotle explains, "or nature, the chief of the artists starts from an ideal conception, not yet existent in matter, but to be realized in the future." (De Part.Anim., 640a).

21. See ibid., I, 1, 639b, 642a. Cf. Roretz, KPO, 35 on Aristotle.

C. Modern Views.

In place of the medieval synthesis of Aristotelianism, Patristic tradition, and Scripture the men of the Renaissance put their faith more in natural reason or what Plato and Aristotle might have called the understanding or discursive intellect. The organon of natural science which was forged by da Vinci, Galileo, and Francis Bacon became the intellectual authority for the modern man, and philosophy adjusted itself to the new spirit. Descartes and Spinoza emulated the handmaiden of physics and mechanics. Descartes' system was dominated by the spirit of logical analysis as he tried to trace back complex and general assertions about the soul, God, and the world to self-certain premises.

1. Spinoza.

Like Plato and Aristotle, Spinoza examined the kinds of knowledge: The sense-bound imagination can at most yield opinion. Rational knowledge sees things as abstract essences sub specie aeternitatis. But scientia intuitiva grasps the unity of things in a way that imagination, lost in detail and illusion, cannot do. It complements the abstract picture delineated by scientific reason with a reference -- so characteristic of the artist -- to particulars of concrete intuition.[22] Spinoza's scientia intuitiva seems to be an extension of Plato's dialectical

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22. See Ethics, V, 28-31. (Wild, SS, 387-390). Cf. SS, xlix-lii.

reason or Aristotle's philosophic wisdom. It is an interpretation of science's abstract universals in terms of concrete intuition. It is a grasp of common properties as living in particulars of intuition. For the understanding of wholes, for the nature of synoptic method Spinoza's view raises several important issues: What is the role of intuition in understanding wholes? Does synopsis or analysis lead toward the "concrete" whole, the actual complex individual?

2. Hume.

Behind Kant's transcendental method there lies somewhat indirectly Leibniz's distinction between *vérités de raison* and *vérités de fait*.[23] By pointing to necessary, *a priori* truths Leibniz was able to challenge Locke's empiricism and the attempt to derive all knowledge from experience. After Locke, Hume exploited to the limit the method of analysis. He dissipated all substances -- material and spiritual -- by what was referred to in the previous chapter as conceptual discrimination. The world was turned into a collection of impressions not entirely unlike the realists' totality of neutral entities.[24]

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23. See *Monad.*, 33. For Leibniz as for Aristotle everything that exists is a functional-purposive whole. That is to say, each living thing and each substance has a dominant entelechy. The living body, for example, is full of other living things -- plants and animals -- each with its own entelechy. (Ibid., 70) Obviously Leibniz's biocentric view anticipated Whitehead's philosophy of organism. (See Whitehead, SMW, 223; PR, 47.)

24. "All our distinct perceptions," said Hume, "are distinct existences." Accordingly, "there is no absurdity in separating any particular perception from the mind." (THN, II, App., 319; ibid., I, Pt. IV, Sec., 2, 200.) Cf. Perry, PPT, 137-139, 78ff., 310-311 on "neutral entities."

Such an outcome threw into relief the epistemological problem of bridging the chasm between a priori reasoning and knowledge of individuals. Leibniz had tried to make a bridge with the principle of sufficient reason. But Hume said that no a priori reasoning or logical demonstration can establish a matter of fact.[26] The truths of fact are warranted by experience or not at all. Hume's scepticism consisted in showing that causality is not a problem of logical demonstration, that the causal relation between events is not a logically necessary relation. With the method of analysis Hume's philosophy attains the generality involved in the neo-realists' neutral entities. He took every complex object or concept apart to find the experiential elements from which it is derived or constructed. Especially does his method raise the question: What is the relationship between analysis which leads to qualities or aspects and analysis which goes to real parts.

3. Kant.

It is common knowledge that Kant took Hume's so-called scepticism -- which had emerged with reconsideration of the relation of vérités de fait and vérités de raison -- as a point of departure. In the Kritik der reinen Vernunft, which had divisions corresponding to Plato's understanding and reason, Kant anticipated a later critique by introducing the notion of organic or organized whole. Discussing the cosmological

26. See THN, I, 91-96.

ideas, he notes that a whole given in intuition (e.g. space) is infinitely divisible, but in an organic body the whole is not similarly organized into infinity. His remarks imply that an organism is not a whole in the same sense as space is a whole, that there is something in organisms which cannot be analyzed in the same way.[27] Perhaps the faculty which makes "things in themselves" definite can deal more adequately with living wholes. This is suggested in the Kritik der reinen Vernunft when Kant discusses the organization of knowledge into a whole, an organized unity like an animal, which only reason can envisage.[28] Kant would agree with Plato or Spinoza that reason as opposed to understanding is the key to ultimate principles. For example, an organized product of nature such as a tree or an amoeba cannot be adequately comprehended by the understanding which treats nature as a complex of sense objects. Nature is full of functional-purposive wholes which demand the insight of reason over and above that of understanding.[29] Thus the question arises as to whether and how synopsis saves appearances that are missed if an object in nature is seen merely as a complex of sense objects (parts).

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27. See Kant, KrV, B551-555. See above, 27ff. Here Kant hints at the difference between aspects and parts.

28. B860-861. Cf. Driesch, Art.(1924), 365-368.

29. See Kant, KU, par. 61, 75. For an exposition of these issues see Henderson, ON, 54-61.

4. Goethe.

Goethe found in Kant's Kritik der Urteilskraft "ein Bild seiner eigenen intuitiv synthetischen Geistesrichtung."[30] As was suggested in the previous chapter, Goethe would give up neither the poet's "anschauendes Bewusstsein" nor the exact scientist's patient analysis and tight logic. The latter is illustrated in Erfahrung und Wissenschaft and in the logic behind his discovery of the intermaxillary bone. On the other hand, Goethe was highly impatient with abstraction, overt experimentation, and quantification which the exact scientist must employ. In Faust he wrote that Nature reveals herself to the patient observer,

> Und was sie deinem Geist nicht offenbaren mag,
> Das zwingst du ihr nicht ab mit Hebeln und mit Schrauben.

With the Kantian notion that only a synthetic universal is adequate to organized beings and real wholes Goethe was in complete accord. He quotes from the Kritik der Urteilskraft with approval and enthusiasm:

> Wir können uns einen Verstand denken, der, weil er nicht wie der unsrige diskursive, sondern intuitiv ist von synthetisch Allgemeinen, der Anschauung eines Ganzen als einers solchen, zum Besondern geht, das ist, von dem Ganzen zu den Teilen.[31]

For Goethe, as for Kant, adequate understanding of wholes

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30. SW, XXXIX, 355. See ibid., 31. Cf. Merz, HET, III, 350n.

31. Kant, KU, par. 77; Goethe, SW, XXXIX, 34. In Goethe's treatise on morphology the discription of a living thing almost repeats Kant's definition of an "organized being." See Goethe, ibid., 252-253; cf. Kant, ibid., par. 66. Lewes maintains that the notion of Type or Idea was for Goethe, as for St. Hilaire and other anatomists, a methodological device and not a Platonic Idea. (LWG, 369) In some of Goethe's own statements, however, the Idea seems to be much more than an "artifice." See Goethe, ibid., 102.

demands something more than analysis and reference to the manifold or aggregate. Trees, plants, animals, and man must be seen as developed "aus einer produktiven Einheit." To this end an intuitive insight of the whole -- much like the artists' way of looking at things -- seems to be necessary. In a later chapter it will be shown how defenders of synopsis take very seriously Goethe's remark about interest in individuals: "Dies ist aber nicht denkbar ohne eine Method, die das Interesse an der Gesamtheit offenbart."[32]

5. Hegel.

Even more than his immediate predecessors Hegel was concerned with the full and adequate comprehension of wholes and the way of "knowing by wholes" that is often referred to as synoptic method. Like Spinoza and Kant he criticized the operationsof understanding and sensuous perception as being misleading and partial. The proper medium of philosophy, Hegel maintained, is the notion, the progressive organization of experience. Reason aims to achieve the concrete universal which is a unification of data like the type of unification found in living things.[33] On the one hand reason is reflective and embraces operations of the discursive intellect. One might say that it is analytical and divisive. The fault of Kant and the empiricists of the British tradition, Hegel believed, was that they did not see the proper relation of

32. Goethe, ibid., 100.
33. Hegel, PG, 73-75; Enc., 186-204.

thought to experience. They were inclined to remain on the perceptive, natural scientific level which was always threatening to pass back into phenomenalism (subjective reason and material idealism).[34]

On the other hand, reason is intuitive insofar as there is a grasp of unity and organization or an appreciation of what were earlier called collective properties, the qualities that mark an object as a unitary whole. Whereas Kant and empiricists were inclined to remain on the discursive level, the romantic and mystical philosophers went to the opposite extreme and suppressed precise formulation of experience-connections in the interest of feeling and pure intuition.[35] Hegel's criticism of Jacobi is characteristic of his criticism of all extreme romanticism: Until brute experience, feeling, and awareness are transcended, there is no philosophical knowledge. "Das unmittelbare Wissen ist nicht Erkennen, Begreifen; dem dazu gehört, dass der Inhalt bestimmt in sich, als konkret gefasst werden."[36] For Hegel, then, reason is an organization and transformation of the "given" which contains much more than the refined and reduced sense experiences that are primary data for the scientist. The aim of reason is the formulation of notions or concepts with progressively greater empirical adequacy and approximation. That is the meaning of "concrete" as opposed to "abstract." Is it possible with a synoptic

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34. See Hegel, VGP, III, 182, 295-296; PG, 83-88.
35. See Hegel, PG, 12-18.
36. VGP, III, 421. Cf. Enc., par. 45.

method to achieve the "concreteness" in which Hegel was interested? Synopsis in contrast to analysis is often linked with the "concrete" view. The important question is: How?

D. Epilogue and Summary.

The reader was forewarned about the purpose of this historical sketch. Only outstanding figures in the history of philosophy have been discussed and then only for the purpose of raising problems and anticipating later chapters. Many relevant and important views of scientists and philosophers of science have been deliberately omitted so the central issues may not be bogged down in historical detail. In any case, some of the methodological problems related to wholes should now appear in bolder relief.

For the pre-Socratic philosophers, as Aristotle suggested, all wholes were ultimately material or physical complexes: Thales' philosophizing ended in water as first principle; Anaximander's in physis; Anaximenes' in air. Though Heraclitus saw the cosmos as a whole, as a unity of opposites, and though Anaxagoras introduced Nous to mix the "seeds" (wholes as unities of diversity) forming the world-whole, they were, like the other pre-Socratics, inarticulate about the instruments they were using to reach such conclusions.

In the Theaetetus Plato deals with wholes and methodology. Wholes are built up of primeval elements which "have

nothing but a name" and are the essence of a definition; explanation is "an enumeration of the elements out of which anything is composed." But when Plato "explains" a wagon by enumeration of the planks (parts), these elements are not in the same category as primitive qualities which "have nothing but a name." Merz, Sorley, and others link Plato's dialectical reason with synopsis. This is justifiable because Plato said that the dialectical thinker is synoptical. "Understanding" moves upon hypotheses, images, and shadows, but reason soars beyond hypotheses to "the first principle of the whole." Plato's suggestions must be untangled in answering the question: How, specifically, are "dialectical" or "synoptical" reason and explanation through "primeval elements" related to the understanding of wholes? Similar problems are raised by Aristotle's "intuitive reason" wherein all things are seen at once and whole, and by his effort to "save the appearances" of purpose in living wholes.

With Spinoza <u>scientia intuitiva</u> follows rational knowledge and sense-bound imagination as a higher stage. Here the abstract picture delineated by scientific reason is given color by particulars of concrete intuition. What is the role of intuition in comprehending wholes? In dealing with issues that had engaged Locke, Leibniz, and other predecessors, Hume emphasized the analysis of an object or a concept into its experiential elements. The effect was to destroy

substance. His world became a collection of impressions akin to neo-realists' "neutral entities": "All our distinct perceptions are distinct existences." (Hume) How is conceptual discrimination, which separates aspects, related to finding parts of a whole, parts which are more than aspects? Kant believed that there is something in organisms which cannot be analyzed in the same way as spatial wholes. His Kritik der Urteilskraft causes one to ask: How is analysis and how is synopsis concerned with "saving the appearances" which are lost if a living whole is "understood" as a complex of sense objects? The same issue arises when Goethe praises Kant's view as "ein Bild seiner eigenen intuitive Geistesrichtung." Goethe would sacrifice neither the poet's "anschauendes Bewusstsein" or a whole nor the scientist's tight and patient analyses. How are the two related? With Hegel Reason aims to achieve the "concrete universal," i.e., the organization of data following the structure of organisms. Steering between romanticism and sensationalism Hegel found "concreteness" in progressive empirical adequacy. Synopsis, in contrast to analysis, is often linked with the "concrete" view. The real question is: How?

CHAPTER III

ANALYSIS

A. Statement of the Method of Analysis.

The conventional and dictionary definition of analysis makes the term mean a resolution of anything into elements and an examination of those elements themselves and in relation to the original whole. Analysts have refined the term by distinguishing kinds of analysis on the basis of intellectual operations themselves or on the basis of materials that undergo analysis. Thus, it has become common to differentiate conceptual and experimental analysis, to distinguish existential and linguistic analysis. How such distinctions are related to views of analysts who will be discussed here -- primarily E. G. Spaulding and R. B. Perry -- will appear later.

Spaulding, Perry, and other neo-realists have defended analysis against intuitionists theories such as those of Bergson and Bradley who hold that analysis entails falsification.[1] Both defenders and oponents recognize that analysis is intended as a method of inquiry and a way of understanding or explaining

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1. See Holt and others, NR, 32: Analysts are opponents of "all philosophies that rely on immediacy for a knowledge of complexes; of all philosophies that regard the many in one as a mystery that can be resolved only by an ineffable insight." See Costello, Art.(1913), 495 and his valuable caution that realists might "perceive the strong as well as the weak points of Bergson" and that Bergson does not deny the possibility of analysis or the validity of concepts but rather insists that "neither words nor concepts are identical with the entities symbolized."

any complex object of attention. But what is meant by understanding and explanation? Understanding means a grasp of the intrinsic properties and features of the problematic object and a grasp of the essential relations which that object bears to other objects. As Whitehead has suggested, understanding has internal and external movement:

> If the thing understood be composite, the understanding of it can be in reference to its factors, and to their ways of interweaving so as to form that total thing. This mode of comprehension makes evident why the thing is what it is.
>
> The second mode of understanding is to treat the thing as a unity, whether or no it be capable of analysis, and to obtain evidence as to its capacity for affecting its environment. The first mode may be called the internal understanding, and the second mode is the external understanding.[2]

To illustrate what is meant by understanding and explanation: After thorough observation and description of the "first seen" properties, a gas in a container is understood in so far as its volume is found to have a definite relation to temperature and pressure. Another level of understanding is achieved as the relation of temperature to molecular motion is fixed. And this in turn links the behavior of the gas to the behavior of a bar of steel or a piece of glass. Again, one understands "jazz" or "swing" music in so far as he knows the relation of music to "immigration" and absorption of Negroes, attitudes toward sophisticated symphony on the part of a semi-frontier people, and the relation of nervous excitation to the tempo of urban life. All this, of course, presupposes "jazz" has been carefully related to musical form, musical ideas, and the like so its genre might be precisely stated.

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2. MOT, 63.

The problematic situation which understanding and explanation aim to resolve consists of a vague and confused relation-relata complex. If analysis and synopsis have any specific differences as methods, those differences will be found in the ways of operating on a problematic or "given" whole so as to achieve order, definiteness, connection, and thus understanding. In their character as methods neither analysis nor synopsis would seem to require any further theory of the "given" that what has been said here about the preliminary situation or starting point of investigation and its relation to explanation.

1. The realists' analysis.

The common opinion of the neo-realists is that analysis is "that method of procedure in which the problematic is discovered to be a complex of simples."[3] Such words immediately recall the aim of Leucippus and the Greek atomists.[4] The discovery of fine identities in place of gross differences, the realist explains, is really only the careful and exhaustive examination of any topic of discourse. Analysis reduces a complex and problematic object of attention to a totality of components and a plurality of factors. The "totality" includes the "combining relations" of the components. For example, a vase is not identical with the various pieces into which it

3. Holt and others, NR, 24.
4. See above, 42-43.

has been shattered unless these are arranged or related as they were before the accident. Again, overlooking "combining relations" in dynamics leads to the conclusion that analysis falsifies by reducing motion to occupancy of positions. But the occupancy, as will be suggested more fully later, has a special order that is revealed by analysis.[5]

Such, then, is the view of analysis to which the neo-realists agreed in their co-operative volume entitled The New Realism. In their separate contributions to that volume Perry and Spaulding elaborated the meaning of analysis. The rest of this section will, for the most part, be an exposition of their views. This exposition will be followed by another section devoted to critical examination and evaluation of analysis before taking up the synoptic method.

2. The positivists' analysis.

To clear the main line of argument it is necessary to distinguish between analysis espoused by neo-realists and the linguistic analysis of logical positivism. The latter is mainly irrelevant to the central dissertation problem. Realistic analysis may operate on an amoeba, Newton's falling apple, Gauss's geometry,or any possible object of thought. Whether the objects ofanalysis are merely subsistents (any possible objects of thought) or existents (objects of thought in the space and time system), those objects are independent

5. See Holt and others, NR, 24.

of the knower.[6] Realistic analysis is thus examination of the content of the world. In this sense it is metaphysical. The neo-realists, in fact, speak of the "full ontological validity" of "the method of logic and of exact science in general" (analysis).[7] In so far as the neo-realist accords "full ontological status" to logical and physical entities, subsistents and existents, he is a "Platonic realist."[8]

Logical positivists and their sympathizers champion an ametaphysical or linguistic analysis. A. J. Ayer has well described such analysis:

> The validity of the analytic method is not dependent on any empirical, much less any metaphysical, presupposition about the nature of things. For the philosopher, as an analyst, is not directly concerned with the physical properties of things. He is concerned only with the way in which we speak about them.[9]

The proper sphere of interest for the philosopher is logic, i.e., the analysis of sentences to find their consequences and relations. The critics of analysis, Ayer observes, usually attack its metaphysical consequences or assumptions. They assume that analysis breaks up objects until the whole universe is an aggregate of particulars united externally. "Linguistic analysis" means, however, the probing into formal consequences and implications of propositions. Like formal logic or mathematics it is not directly concerned with things,

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6. See Holt and others, NR, 35, 253.

7. Ibid., 26.

8. See ibid., 35. Logical principles, Spaulding explains, are objective in the sense of Plato's Ideas or Aristotle's forms.

9. LTL, 61. (Ital. mine.)

objects, or existents. These references, the later-day positivists have sought to show in the study of semiotic, belong to sign theory (syntax: language referring to language) or to the content of some special science (language referring to "the behaviour of physical, or even mental, objects," i.e., factual propositions).

The "realm of subsistence," according to Morris, is not a metaphysical question so much as a semiotic issue. It calls attention to the fact that the designatum of every sign is a class of objects which may have many or no members. If its members are at a place and time which can be measured in relation to other objects, the designatum is a thing or existent. Otherwise the reference is merely to symbols and concepts. According to Morris and Carnap, a semiotic analysis makes it unnecessary to introduce a realm of existents and a realm of subsistents or essences.[10]

Neo-realists, of course, could agree to much of what Ayer, Carnap, and Morris say about the value of logical analysis. As W. T. Marvin suggests, the proper "world of discourse" for philosophy is logical analysis of formal and material premises rather than psychological facts.[11] But for thinkers like Perry and Spaulding logical analysis is not merely a probing of the inter-relationships of words and signs. These men are Platonic realists so it is a means of laying bare the

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10. See Morris, Enc., I, 2; 5, 15. Cf. Carnap, Art.(1939), 221ff.

11. See Holt and others, NR, 95n.

structure of the world. The method of logic and the analytic methods of exact science have "full ontological validity."[12] Since realists claim both logic and science as instances of the analytical method, they regard analysis as sufficient for all understanding. Certainly understanding requires the application of logic -- tracing out implications and clear statement of the relation of evidence to conclusions. These operations, in turn, require analysis of any body of assertions claimed to be knowledge. But further uses of analysis, and the exact sense in which the methods of science are analytical, await more clarification from the realists.

3. Perry on analysis.

In his little book entitled Defense of Philosophy Ralph Barton Perry characterizes philosophy as "that branch of knowledge which attempts to get to the bottom of things, and to embrace the whole of things."[13] It seems to require both the poetic insight in which every part reveals the meaning of the whole and the more prosaic view whereby analysis of the "flower in the crannied wall" carries one "abroad

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12. Since neo-realists and positivists seem to agree in a number of ways, why do they disagree about "ontological validity" of analysis? Though it is here neither necessary nor feasible to try settling such disagreement, it may be instructive to consider its grounds. Positivists argue that there is no way of testing the basic thesisof "Platonic realism." "Objectivity" and "real" must have meaning in terms of the actual or hypothetical occurence of experiences. So logic is not concerned with the world's structure but rather with syntax, and science aims to predict experiences. (See Ayer, LTL, 29-30, 35.)

13. 17.

into the domain of all reality."[14] Thus, the philosopher must employ both the method of abstraction and intuitive insight.

> He may learn the area of the country in number of square miles, its population, topographical measurements, industrial and social statistics, and thus come to grasp it all by "conceptual abstraction." Or, he may by the breadth and intimacy of his acquaintance and by the liveliness of his imagination come to see and feel its individuality, as one "little world," one "blessed plot," one "earth," one "realm," like Shakespeare's England. This is whatI have called intuitive insight.[15]

Philosophy presses both attitudes and ways of comprehension forward so as to grasp the "whole of things."[16] Perry seems to be saying that philosophy and any truly adequate investigation must rely on some other method than that of analysis, must rely on the method of poetic insight whereby one "feels individuality." Whether this is the case and whether adequacy demands a synoptic method such as will be described in the next chapter calls for further examination of the realist's position.

In Present Philosophical Tendencies Perry notes the ambiguous position of philosophy between the theoretical demands of science and the religious concern with action, destiny, man's hopes. Since life is best served by a theoretical detachment, philosophy should, Perry believes, examine ultimate causes by "the method of critical analysis." Philosophy may

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14. Perry, DP, 14-15.
15. Ibid., 19-20.
16. Ibid., 26, 28.

reach beyond the limits of science for answers to those problems that underlie religious faith; "For the philosopher's is the prior task of seeking that knowledge itself from which the passions may derive their light and guidance."[17] Elsewhere in Present Philosophical Tendencies Perry repeats the thesis to which he had subscribed in the New Realism: analysis is the method of exact knowledge in general. The analytical version of scientific concepts makes them "ratios or relational complexes of simple terms of experience." This method suffices for all other concepts.[18] Failure to press analysis forward leads the philosopher into the error of pseudo-simplicity where the pre-analytic simplicity is given priority and is used to discredit the post-analytic simplicity that accompanies knowledge.[19] Perry defends analysis on the grounds that knowledge, in contrast to "immediate apprehension" requires such a procedure:

> The method of analysis presupposes that the nature and arrangement of the parts supplies the character of the whole. If such were not the case the specification of the parts and their arrangement would not afford a description of the whole, and one would have to be content with an immediate or mystical apprehension of it.[20]

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17. Perry , PPT, 41. See ibid., 29-30.

18. Ibid., 61-62.

19. See ibid., 65-66. In such an error the investigator, Perry explains, fails to recognize the difference between the simplicty due to ignorance andthat due to knowledge. The pre-analytic unity hovers in the background of the mind, tends to discredit analysis, and seems to contradict the results of analysis.

20. Ibid., 319. Most criticisms against the analytic method, Perry says, are based on misunderstandings. Referring to James and Bergson's attack on the analytic version of continuity, Perry reminds the reader that the symbols standing

In his statement of "A Realistic Theory of Independence" Perry rightly insists that a precise definition of dependence and independence is essential to such conceptions as coherence, synthetic unity, and wholeness.[21] In formulating such a definition, Perry throws light on the relation of analytical method to wholeness. For ulterior epistemological reasons the realist distinguishes dependence and relation. "Dependence is something over and above bare relation."[22] Were it not, the belief in the independence of objects from the cognitive consciousness would entail complete agnosticism. The realist maintains that various objects sustain the cognitive relation only accidentally. Leaving aside mere relation for the purpose of this discussion, one notes that Perry finds four general modes of dependence: whole-part, causation, implied and being implied.[23] In the first mode, which is the center of interest here, an object is dependent on what it contains. It is dependent on what it "can be analyzed or divided into." For Perry, it will be shown presently, this is the primary direction of whole-part dependency.

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for continuity or blue may themselves be discrete or black. And the use of analysis does not mean that everything is reduced to logic: "The analytical method does imply that reality consists of terms and relations. It does <u>not</u>, however, imply that this bare term-and-relation character <u>is</u> <u>all there is to</u> it." (PPT, 234) For example, "Bare logical order <u>is</u> static; and can neverof itself express time. But it is an utterly different matter to regard time, like space and number, as a <u>case</u> oforder, having the specific time <u>quale</u> over and above the properties of order." (Ibid., 235) Perry notes, as does Spaulding, that in the time series the instants possess "a unique time character of their own."

21. Holt and others, NR, 105.

22. Ibid., 114.

23. Ibid., 107-113.

The whole-part dependency, according to Perry, has a formal aspect (a relation between variables) and a material aspect (a relation between particular values of the variables). For example, the yellowish volume-knob is materially dependent as part on the table-model Westinghouse radio set in brown bakelite box operated by DC power. The formal and material dependence of part on whole -- the relation of hypotenuse to right triangle orpancreas to mammal's body -- is reducible to other types of dependence. This is an important assertion for Perry to make. He explains that when one says the hypotenuse is dependent formally on the right triangle, there is only tautology. "The side-opposite-the-right-angle-of-a-triangle cannot be such without the triangle." In other words the conception of triangle depends on the conception of triangle, or a part cannot be a part or belong to a whole without that whole. "This is equivalent to saying," Perry offers, "that the complex relationship of part and whole depends on the whole as one of its terms. And this is a case of dependence of whole on part, and not of part on whole."[24] In most cases of material dependence there is emphasis on the interdependence of parts so that the whole-part relation is ignored for some other mode of dependency. For example, the dependence of the pancreas on the heart is more important as a causal dependency than as whole-part dependency.

In Perry's use of analysis with "dependence" and the whole-part relation there are some matters to be criticized in the

24. Holt and others, NR, 108.

section following Spaulding's views. It follows from what Perry has said about dependence that all simple entities are mutually independent. They cannot be dependent in the whole-part relation because they do not themselves consist of parts. They cannot be dependent in the part-whole relation because, Perry has argued, this reduces to the dependency of whole on part or part on part. The legitimacy of such reduction will be questioned later. Again, simple entities cannot be causally or implicatively dependent because those modes hold only between complexes.[25] It follows, then, that a simple entity cannot be dependent on the complex of which it is a member without the complex being a part of one of its own components or without the components being causes or impliers of themselves. Further, complexes themselves may be destroyed without affecting the components which are independent.

All these statements are implications of the definition of dependence which

> reveals the important fact that dependence is not always reciprocal. While a complex depends on the terms into which it may be analyzed, these are none the less independent of the complex.[26]

The basic question, as Perry's own remarks suggest, is whether the whole-part dependence is non-reciprocal. If he is right, here is an argument for the thesis that simple entities are independent of consciousness and knowledge because they are not dependent on the whole of which they may be parts. Though

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25. Holt and others, NR, 118.
26. Ibid., 119.

they must be experienced in some context or schematism, the general conclusion is not imperilled:

> The ultimate terms of experience are at any rate independent, whatever may turn out to be the case with certain complexes of these terms. If the knower desires to eliminate the personal equation and seize on things-in-themselves, his safest course is to sift experience into its elements and thus obtain a sure footing in the independent world.[27]

4. Spaulding on analysis and wholes.

Spaulding's discussion of wholeness and analysis, like Perry's, is made in and for the sake of the neo-realistic perspective:

> My specific purpose becomes, then, not simply to defend analysis qua analysis, but also by this means to defend the general realistic interpretation of both whole and part. I shall, then, defend analysis as a method of knowing which discovers entities or parts which are real quite in the same sense as are the wholes which are analyzed.[28]

Already there is apparent a difference between the views of Spaulding and Perry. For the latter, the simple elements in which analysis terminates are not on the same footing as the whole out of which they were analyzed. Perry, in fact, argued that the further analysis is pressed toward ultimate terms, qualities, or indefinable entities, the nearer the knower approaches independent "things-in-themselves."[29]

a. Analysis.

Spaulding's distinction between formal and experimental or material analysis is not a distinction between variables

27. Holt and others, NR, 128.
28. Spaulding, Art.(1912), 155.
29. See Holt and others, NR, 52, 54-55, 128.

and constants.[30] In formal analysis the parts of a complex "are distinguished and discovered but nevertheless left *in situ*." Some objects may be physically taken apart in experimental analysis, but at a certain stage this procedure must be supplemented by other methods

> which are identical with mathematical analysis, methods which are based on rational principles, methods which lead to analytical results that in many cases are directly confirmed by further experimentally directed observation. Such analysis may be called formal.[31]

The difference between formal and material analysis might be clearer if some examples of application were offered. The former is the method of dealing with motion in terms of occupancy of points and instants, with the number continuum, and the time series. The latter is the method of dealing with complex or existing things such as chemical, physical, or biological entities. In contrast to the empirical observation and experimental operations involved in material analysis, formal analysis is conceptual.[32]

These remarks on the kinds and functions of analysis suggest its meaning for Spaulding:

> Analysis is the discovery, or, possibly, the invention of parts --- parts of the whole analyzed. Which of these analysis is -- discovery or invention, -- revelation of fact or falsification --, is in reality the central question at issue. On this point parties divide. But all agree that that which is analyzed is in some sense a whole, and that to which analysis leads is in some sense a part.[33]

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30. See above 69 on Perry's formal and material dependence.
31. Spaulding, Art.(1912), 156.
32. See Spaulding, TNR, 158.
33. Spaulding, Art.(1912), 155. Cf. Spaulding, TNR, 192-3.

Analysis clearly involves the whole-part relation stressed in the exposition of Perry's views. The realists believe that analysis means the discovery of parts that exist or subsist independently of the analysis. In this they oppose the position that to analyze means to construct or invent. Spaulding remarks that this is the position of pragmatism -- analysis is justifiable because "its validity is identical with its verification."[34] The realist may admit many of the theses of pragmatism. But there is a point at which he must draw the line. It is only to the position that the validity of analysis

> is in any specific case identical with its verification, that the realist is fundamentally opposed. For such a position means, he holds, subjective idealism. Of that he can and will have none.[35]

There are other features of analysis than the discovery of parts or the discovery that a certain object is complex and composite. Analysis reveals also relations that organize the parts as well as "those properties which, in some cases, the whole, as a whole, may have different from those of the parts."[36] Spaulding urges that these diverse products of analysis are quite as "real" as the whole which is analyzed and are independent of their discovery and specification. As mentioned before, Perry seems to believe, somewhat differently from Spaulding, that the products of analysis are more "real" than the starting point. In any case, much criticism of

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34. Spaulding, Art.(1912), 158.
35. Ibid., 159.
36. Ibid., 161.

analysis as falsifying is emptied if one remembers Spaulding's aim to "save the appearances", but at the same time to achieve adequate understanding: "The whole...is the parts and their properties and the relations relating the parts and the possibly specific properties of the whole."[37]

b. Types of wholes.

Applying the method of analysis, Spaulding finds several types of wholes, one type being distinguished from another primarily by the relations that hold among the subordinate parts. The present exposition of Spaulding's grouping of wholes amplifies the brief consideration which appeared in Chapter I. And the previous criticism of his classification will receive further confirmation in the "Critical Examination" which follows.[38] In a collection or aggregate the components are related by "and," elements are related by numerical conjunction. "Anything, taken with at least one other 'something,' and these two with another something, and so on, form a whole."[39] Certainly the universe is a whole in this sense. It is at least an aggregate of all entities, but may be more if other relations besides mere conjunctive relations are present. As Spaulding remarks, an aggregate is often confused

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37. Spaulding, Art.(1912), 161. The last clause in the above statement -- "the possibly specific properties of the whole"-- was emphasized in Chapter I in connection with the definition of sum and whole and the difference between part and moment. See above, 16, 22ff.
38. See above, 22ff.
39. Ibid., 163. Cf. Spaulding, TNR, 193.

with other types of wholeness:

> A whole may be a mere aggregate notwithstanding certain other relations, such as those of similarity and difference, among its parts. Such a whole, however does not seem on the basis of genuinely empirical investigation to possess any distinctive properties as a whole; it is simply its parts, with their properties summed and numerically conjoined.[40]

In the second type of whole which Spaulding considers, the parts are similar in at least one respect and related by one or more relation other than mere numerical conjunction. Such wholes are classes or assemblages of similar individuals that are not themselves classes -- e.g., carbon, American, space, time.[41] Here the nonconjunctive organizing relations and the uniqueness of the terms are all important. To overlook them is to make a clearly false analysis. Accordingly, space, motion, and time are not analytically reduced to nonspace, rest, and nonduration. Space has a continuity (asymmetrical and transitive relations) like that of the real number series, "But its continuity is a continuity of points, not of numbers; that is, there is a quale in the spatial element, which the numbers lack."[42] Furthermore, Spaulding warns, to ignore the organizing relations of points and instants which define continuity, is to lead to the mistaken belief that the results of analysis "contradict" the object analyzed -- in the present case continuous extension or duration.[43]

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40. Spaulding, Art.(1912), 164.
41. Ibid., 169-170. See above, 32, on classes as "wholes."
42. Ibid., 184. In his criticism of realistic analysis Costello overlooked this difference between mathematical and spatial or temporal continua. See Art.(1913), 497-498.
43. See Spaulding, Art.(1912), 188-189, 192-194.

Defense of wholes like space, time, and motion -- classes of "individuals" -- involves, Spaulding believes, defense of the atomic theory. Combination of certain substances in rational proportions, variation of temperature and volume of gasses, and the general periodicity of chemicals are analytical data which carry with themselves "the assertion of the one hypothesis which in the present state of our knowledge, is the only one that will explain them all." Spaulding concludes:

> Then the entities, the atoms, which that hypothesis denotes, are to be accepted as real in exactly the same sense as are the data which they explain.[44]

He remarks that here, as in other analyses, apparent falsity and distortion can be avoided if one remembers the organizing relations and the nonadditive results of organization -- the specific properties of the whole. His emphasis in regard to the atomic theory as illustrative of the whole-part relation underlines the thesis that the products of analysis -- atoms, molecules, and electrons -- exist in the same sense as that which they explain. The third type of whole is the class of subordinate classes rather than individuals. The whole is an organization of types wherein individuals are instances of "states of affairs" that are as real as the wholes analyzed.[45]

The fourth main type of whole with which Spaulding is concerned is the organic whole. An organic whole is a complex of elements "which, related, do modify or influence one another, or which perhaps are constituted by virtue of their

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44. Art.(1912), 228.
45. Ibid., 233-236.

relation to one another."[46] Not only do living things exemplify such wholeness, but physical complexes also have properties which are lacking in their parts and which are not derived additively from the parts. Some physical properties are clearly additive -- volume, magnetism, and the heat of combustion of organic compounds. In other cases of physical complexes, there is a different situation. For example, water has certain specific physical and chemical properties in itself as a compound. The former are its specific gravity, boiling point, and the like. The latter are the ways it combines with other compounds such as sodium chloride or sulphuric acid. By experimental analysis water may be split into hydrogen and oxygen which have certain similarities to water in physical properties but definitely different chemical properties. Thus, there is in the whole and parts something new. Of these new properties Spaulding says:

> These properties are put 'in relief' by the analysis; they are a residuum, characteristic of the whole as a whole, and revealed by analysis which at the same time reveals the parts or elements, and, through its ramifications, <u>organizing relations</u>.[47]

Thus analysis sets problems. It may be directed to a whole which is not merely the sum of parts and whose properties cannot be deduced from parts. Analysis also calls for "the empirical ascertainment in many cases of the functional relation between the properties of the whole and those of parts."[48]

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46. Spaulding, Art.(1912), 240. See Spaulding, TNR, 500.
47. Ibid., 238.
48. Ibid., 240. The problem of explaining the so-called non-additive results of organization is well described in WC, 227. See ibid., 237; TNR, 446-449.

In discussing organic wholes, Spaulding is especially concerned with adjusting analysis to the "nonrational element in nature." As noted above, analysis puts certain specific properties and qualities in relief. These are merely found and not deducible from other facts though they may exemplify types of logical order and types of law. There are, Spaulding believes, two ways in which the analyst may deal with the "nonadditive results of organization," contingencies, or the "nonrational element in nature." On the one hand, he may hold that when parts are analyzed out or synthesized in, they are changed in certain respects. Then "the parts when in situ will actually be constituted by their relation to other parts."[49] On the other view, the analyst may hold that the parts remain the same but gain new properties at different levels. Either of these metaphysical theories is compatible with the method of analysis. They are theories to account for the "specific properties of the whole" or collective properties in distinction from distributive properties. In any case, it is impossible to deduce the properties of the whole from the part and vice-versa. This "nonrationality" and contingency is quite apparent in the analysis of living things:

> All the evidence, now, shows that the organism consists of cells, of colloidal particles in solution, of molecules, of atoms, and electrons. At each level as we go upward synthetically, new properties appear. Going downward analytically, there is on the whole a loss of properties. There is a tendency toward simplification.[50]

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49. Spaulding, Art.(1912), 241.

50. Ibid., 241.

From his earlier to later books Spaulding seems to shift and revise his view of the nature of an organic whole. In The New Realism he speaks of organic wholes or unities as illustrated by any chemical compound or an organism.[51] There is causal interaction and such an organization of elements that the whole has new properties which the parts lack. The New Rationalism cuts beneath the earlier position to state very specifically the abstract logical pattern involved. An organic whole is a causal whole or an infinitely complex web of causal relations. By causal relation Spaulding means one that is in form asymmetrical and transitive.[52] As though to anticipate objections that this does not jibe with the notion of cause actually used in exact natural science, he observes that an organic whole may have functional noncausal relations. It will be remembered that the simplest functional whole is one in which there is a one-one relation (and, of course, n-valued functions are possible) correlating terms of one series with those of another.

What is to be noted about the argument in The New Rationalism is its provision for unique levels of organization and its provision for purposive wholes that are causal wholes but something more.[53] Spaulding will not grant that a purposive process is only a causal process read backwards.

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51 See Spaulding, Art.(1912), 157, 236-247. See above, 32, on functional wholes. The present discussion gives Spaulding's view of how analysis deals with what were earlier called functional wholes.

52. See ibid., 157; TNR, 156-157.

53. See ibid., 196, 509-514.

This is a frequent argument designed to keep biology -- or any science that apparently needs teleology -- within the realm of strictly physicalistic portrayal of nature. Evolution, Spaulding believes, is teleology as an existential process. It implies at least change with direction, and correlation with time gives direction. The logical basis of direction is a series of instants related asymmetrically and transitively. But if this is completely identified with teleology, there is no growth in complexity, no purposive advance or progress. Then means and ends only describe the direction of change. They are merely numbers of a series in which one finds the means "as earlier asymmetrically related to the end as later."[54] But evolution brings to change the idea of emergence, the production of new wholes. Spaulding believes that

> there is an existential creative synthesis that is also a temporal process in which there arise new wholes with new properties. These properties undeniably have their place in the evolutionary scheme of things.[55]

For such reasons he rejects his belief of The New Realism essay that the "end" is merely a later stage in a causal complex whether it be an organism or a physic-chemical complex.[56]

In A World of Chance (1936) there is a sharp cleavage between the organic level and that of chemical, physical, and mathematical organization. Spaulding no longer identifies

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54. Spaulding, TNR, 511.
55. Ibid., 512.
56. See Spaulding, Art.(1912), 245-246. Cf. TNR, 513.

causal and organic wholes. They belong to distinct levels, though the levels certainly overlap at least in one direction. The specific and irreducible feature of an organic whole -- interpretable in terms of unique organizing relations and pattern -- is the presence of telic structure. There is internal determination, the whole organism "controls" the process of regeneration so the part serves it, and in human behavior there is conscious selection of an end and the autonomous determination of means by end.[57] To be sure, there are physico-chemical processes in an organism, but they are comprehensible only in terms of their service to the "organism as a whole." Teleology, Spaulding believes does not necessarily entail effects of a conscious agent, but it clearly marks off an organic whole from the level of physical causality. In his essay in The New Realism Spaulding vaguely anticipated this conclusion. There he "resolved" the vitalistic problem by noting that in biology causality operates with specifically different constants. "Vitalism is but another word," Spaulding wrote, "for not-pure mechanism."[58] The specific properties of a living whole are no more deducible from those of certain hydrocarbon compounds than the chemical properties of water are deducible from those of hydrogen and oxygen.

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57. See Spaulding, WC, 239, 232.
58. See Spaulding, Art.(1912), 247.

B. Critical Examination and Discussion of Analysis.

Though the analysts' argument at first is compelling and convincing because it seems so much like contemporary common sense reflecting the spirit and method of exact science, that argument is really a bundle of perplexing problems and doubtful implications. The following paragraphs will elaborate vulnerable and questionable points in the analytical method as described by Perry and Spaulding.

1. The direction of whole-part dependency.

In connection with Perry's discussion of dependence[59] there are assertions about the formal-logical relation of whole and part that need examination. A basic question is whether or not the whole-part dependency, logically, must be nonreciprocal. The primary direction of "holistic" dependency, according to Perry, is whole-part, i.e., an object is dependent on what it contains or can "be analyzed into." What is Perry's proof for this? It lies in an attempt to show that the formal and material dependence of the part on the whole (note the order) is reducible to that of whole on part. Suppose one were to say that the hypotenuse is dependent on the right triangle. This is equivalent to: "The side-opposite-the-right-angle-of-a-triangle cannot be such without that triangle." Thus, a part cannot be a part or belong to a whole without that whole. "This is equivalent to saying," Perry asserts, "that the complex relationship of part and whole depends on

59. See above, 69.

the whole as one of its terms. And this is a case of dependence of whole on part and not of part on whole."[60] But there is another equivalence: The complex relationship of part and whole also depends on the part as one of its terms. And this is a case of dependence of part on whole. The relationship of whole-part is clearly reciprocal. The reciprocal dependency follows from the definition of whole as an organization of parts, from the way wholeness, by definition, implies partness.

Demonstration of the reciprocal rather than nonreciprocal dependency of whole and part has some noteworthy consequences for Perry's defense of the theses of neo-realism. If the dependency of whole and part does not reduce in every case to whole-part (note the order), the mutual independence of all simple entities is undermined. Their simplicity is then no guarantee of their independence. And it also follows that a complex may not be destroyed without affecting the relatively simple entities. Then there are no purely dialectical grounds for asserting that though simple entities must be known in some context or schematism, "The ultimate terms of experience are at any rate independent, whatever may turn out to be the case with certain complexes of those terms."[61] At this point the difficulty comes from trying to have cake

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60. Holt and others, NR, 108. In this quotation Perry subtly shifts the meaning of whole. The first sentence means that a part cannot belong to a whole without that whole. But in the second sentence the whole, which is dependent on part, is the "complex relationship" where whole functions as a term.

61. See above, 69-72.

and eat it too. With dependency of whole-part being reciprocal, Perry cannot defend at the same time and for the same purpose the ultimacy of a logical pluralism and an experiential wholeness. If the simple entities must be known in some context or schematism, the ultimate terms of experience in the sense of experienced-terms cannot be independent. It is, of course, possible to justify the view that results of analysis are not dependent on the knowing experience. And one may agree with Perry that things are not dependent on knowing but still argue with evidence that those things are conscious things. (Idealism) The independence of entities from the knowing experience would not seem to be proved by the argument that the direction of whole-part dependency is non-reciprocal.

2. Division, analysis, and analysis into qualities.

In Perry's assertion that an object is dependent on what it "can be analyzed or divided into"[62] there is hint of an ambiguity that runs through the realists' notion of analysis. It is a grave mistake to identify analysis which separates out qualities and aspects of an object with analysis which goes to parts with their own properties. Using this mistake the analyst tries to show how a certain theory of space and events is on a par with the physicist's atomic theory. He tries to show you that if analysis is sound in

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62. Holt and others, NR, 108. See above, 25-26.

one case it is also sound in the other. But "division," like analysis into qualities or aspects is really a form of analysis *in situ*. Analysis *in situ* is formal and conceptual in contrast to the physical, manual, and experimental operations of material analysis.[63] The former is the method for dealing with such wholes as motion, space, and time. That method may be applied to anything other than a simple abstracted quality. It marks out the qualities or aspects by reference to which the object is characterized.

The common sense meaning of division is preserved if you say that the resulting "parts" are alike in quality, though not in quantity, with the whole that was divided. For example, when a pie is divided, the pieces or elements are still pie. Similarly, volume may be divided and its elements are still volume. In division the nature of the elements may be inferred from that of the whole which is divided because *the primary consideration is quantity*. In dividing any object you purposely and deliberately forget everything but "how much." Your main interest is "more or less than" of the same thing.

Division, then, is related to the notion of sum or aggregate. Division alone is not adequate for understanding genuine wholes, i.e. complexes which have specific properties of their own besides the properties of the parts-in-relation.[64] The purpose and results of division are clear when it is compared with the analysis used on physical complexes, organisms, or chemical compounds. A *division* of salt does not lead to

63. See above, 71-74. Cf. Spaulding, TNR, 158.
64. See above, 22-30.

something qualitatively different from the original mass. But analysis, in the realists' argument, does. Analysis leads to sodium and chlorine atoms and finally to electrons. It is highly confusing to identify division and analysis as Perry does.

The classification of wholes in Chapter I suggested the urgency of distinguishing between the analysis which separates out qualities and aspects and the analysis which goes to parts with their own properties. Krikorian's classification of wholes divides at the point of "substantial unities" or what common sense refers to as "things." Unlike Spaulding's classification Kirkorian's points to the radical difference between elements such as qualities that are marked out in conceptual analysis and parts which are more than abstracted qualities, which are themselves objects. From the preceding exposition it is clear that Spaulding knows the difference between analysis into qualities and analysis into parts. The difference lies in the contrast between analysis <u>in situ</u> and material analysis. This difference should prevent Spaulding from putting "wholes" like space, time, and motion on a par with physical wholes whose parts are atoms. But it does not. So he urges, quite mistakenly, that defense of wholes like space and time also involve a defense of the atomic theory.

In view of the above criticism itis necessary to reinterpret the realist's general thesis that analysis -- the method, he says, of exact science and logic -- explains by discovering that the problematic object is a complex of

simples and by reducing the complex object of attention to a plurality of factors. Conceptual discrimination and analysis *in situ* may discover the problematic object to be a complex of simples. The "simples" are abstracted qualities or properties. In a brick, for example, the composing qualities, which may be further reduced, are weight, reddish or brown color, hardness, roughness, and rectangular shape. The analysis in this instance is epistemological. In sense-data or essences it finally comes to rest. Here the object is a whole whose "parts" are qualities or aspects. Of this sort of analysis Perry's statement is adequate and appropriate:

> The method of analysis presupposes that the nature and the arrangement of the parts supplies the character of the whole. If such were not the case the specification of the parts and their arrangement would not afford a description of the whole and one would have to be content with an immediate or mystical apprehension of it.[65]

Conceptual discrimination and analysis *in situ* do "afford a description of the whole," and without these procedures "one would have to be content with a mystical apprehension" of the whole. Thus, analysis of space or time gives a more exact description or definition in terms of order and points or instants. When the realist says that the instant has "a *quale* different from the *quale* of the point," he is recognizing in a very impersonal way that the meaning of terms in his description depend on the experienced wholes of space and time. He does not emphasize the abstractive route that led to his description. Whitehead has traced the "analytic"

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65. PPT, 319.

route that leads to description of space and time:

> In the act of experience we perceive a whole formed of related differentiated parts. The relations between these parts possess certain characteristics, and time and space are the expressions of some of the characteristics of these relations. Then the generality and uniformity which are ascribed to time and space express what may be termed the uniformity of the texture of experience....This uniformity does not belong to the immediate relations of the crude data of experience, but is the result of substituting for them more refined logical entities, such as relations between relations, or classes of relations, or classes of classes of relations.[66]

But Perry gives no hint of recognizing that his remarks about analysis apply only to a special type or function -- to analysis which ends in refined aspects rather than parts with their own properties. In regard to the latter, that is, in regard to "parts" in the sense in which that term has been used here, Perry's statement is inadequate. It is a call for reduction and, necessarily, distortion. Spaulding, on the other hand, is aware that explanation may require a different sort of analysis and a shift of procedure in which parts are discovered which themselves are objects rather than simple qualities. On this level the parts of an automobile are sparkplugs, crankshaft, pistons, bearings, universal joint, and so on. The parts of a book are cover, paper, thread, paste, and cloth. This shift requires analysis on a different level and for a differentpurpose -- material analysis involving imagination, hypothesis, and inference to explain the qualities of a book as a book or an

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66. OT, 216-17.

automobile as an automobile (the specific and unique properties). Exact natural science, par excellence, uses a method of analysis which finds parts that are more than abstracted qualities or aspects. (Atoms, genes, protons are at least complex hypothetical entities.) Science reveals, Dewey observes, "the state or order upon which the occurence of immediate or final qualities depends."[67]

The realists' general thesis that analysis reduces the problematic object to a complex of simples especially needs amplifying in the case of material analysis. Through material analysis the scientist seeks causes and conditions. In dealing with "organic wholes" such as water, an amoeba, or salt, the investigator first of all relates the object to others to find similarities. In the case of chemical compounds this results in the periodic table. In the case of organisms it may result in discovery of common processes of growth, assimilation, reproduction, locomotion, adaptibility, etc. From these relatively simple data, from the discriminated qualities of the original problematic object which was a whole, the scientist moves to hypothetical entities and statements about the underlying condition of order in the data. By hypothesis and inference the scientist seeks entities that define the conditions of the specific and unique properties of the whole under consideration; those entities will be the parts with their own particular properties.

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67. EN, 136. Seeibid., 2-3.

If the realist intends that the scientific analyst moves from complex object to hypothetical entities that explain the features of the object, it is true that the investigator moves toward "simples" because a hypothesis about conditions and causes presupposes that a certain amount of conceptual discrimination has taken place on the problematic object as "first seen." But the specific scientific objects -- for example, molecules, cells, genes, or the material tools of a society -- are not simple in the same way a point is simple in relation to the space continuum. Nor is the scientific object a "part" of the original problematic complex in the same way as a point is a part of space, as reddish-hue is a part of the brick, or as a piece of pie is a "part" of the whole pie.

3. Validity of analysis and its relation to metaphysics.

The realists' remarks about the validity of analysis and the reality of the results of analysis rest on two basic theses. The first is that the validity of analysis is not identical with its verification, i.e., the results of analysis, the discoveries, the entities referred to by hypotheses that emerge in material analysis are objective "states of affairs" distinct from and not dependent on (caused by) their being known. Spaulding asserted in connection with <u>material</u> analysis[68] that the entities referred to by any hypothesis are real in exactly the same sense as the data they explain.

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68. See Art.(1912), 158-159.

Is the law of falling bodies real in the same sense as my-book-dropping--off-the-table is real? Is Heisenberg's matrix real in the same sense as are the shifting spectral lines? Is any refined conceptual abstraction real in the same sense as the vivid, "enjoyed," and experienced data from which it is abstracted? Perry suggests that analysis terminates in neutral entities which do not exist at all. "The simple entities are nowhere."[69] So the results of analysis do not belong to the same category as the "real" things analyzed. Since Spaulding gives no hint of rejecting this thesis of neo-realism, he apparently means something else by the "real" entities any hypothesis refers to. In using the term real, Spaulding means objective, independent, or universally valid. He means, apparently, that analysis is not artificial construction, that its validity is not identical with its verification, i.e., the law of falling bodies is an objective "state of affairs" that is discovered and not made in verification. But this is finally no more than a distinction between the definition or meaning of truth and its criteria or tests. To make truth dependent on or equivalent to its tests, says Spaulding, is the same sort of error as identifying the results of analysis with verification of those results. Analysis is advanced as a means of discovery, and not invention, of a state of affairs that is not caused by being known.

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69. See Spaulding, Art.(1912), 158-159.

Truth, Spaulding believes, is the subsistence of a specific relation -- a functional relationship of correspondence -- between the knowing process and the entity known. But this definition

> only indicates the difficulty of finding a test whereby to ascertain whether knowledge in any specific instance is true or not. But the presence or absence of this test is not identical with the presence or absenceof knowledge, for the former concerns proof and the grounds of conviction, the latter, the presence or absence of truth.[70]

The realist is certainly right that belief always has some relation (true or false) to an object. But what that relation is can only be ascertained through verification and testing.[71] To know whether the results of an analysis of water, an automobile, or an amoeba are true one must verify hypotheses that take one beyond the problematic object as a qualitative whole. But the truth of those hypotheses is, of course, distinct from verification.

The second thesis on which the realists' remarks about the validity of analysis depends is their particular metaphysical scheme. "Validity of analysis" is really a question-begging phrase. For the realist it seems to mean that analysis is justified because the world does in fact consist of terms and relations which, like truth, are found and not invented. "The analytical method," writes Perry, "does imply that reality consists of terms and relations."[72] Analysis, then,

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70. TNR, 423-424.
71. See Montague, Art.(1909), 546-548.
72. PPT, 234; see ibid., 78: analysis leads to "logical realism." Cf, Spaulding, WC, 222-228.

is simply a reflection of metaphysics. The attack on Bergson and Bradley is really an attack on their metaphysics because analysis means that the world is a complex of terms and relations. "Validity of analysis," in spite of analysis being called a "method of procedure" and a "method of knowing" is for the realist a thesis in metaphysics rather than a methodological question. It is an implication of the ratio essendi rather than something connected primarily with the ratio cognoscendi. All this is to be expected in view of W. T. Marvin's spirited defense of the "dogmatic" thesis that epistemology presupposes a theory of reality and is really a metaphysic in disguise.[73]

4. Analysis and the "specific properties of wholes."

In spite of all these difficulties in the realists' method of dealing with wholes, there is a noteworthy effort especially on Spaulding's part to deal with "real" wholes, i.e. with such complexes as have certain unique or specific properties over and above those of the parts.[74] There is an effort to deal adequately with those complex objects whose parts are other objects rather than abstracted qualities or aspects. Such wholes, it was noted earlier in this chapter, fall under the general class of "organic wholes" -- e.g. an amoeba, a human body, a chemical compound, a machine, or a physical mass such as a quantity of steel -- and such wholes have properties which are lacking in their parts. Also, the

73. See NR, 74ff.
74. See above, 27.

parts have their specific characteristics. The function of analysis, Spaulding says, is to put such properties "in relief."[75]

Spaulding recommends two other steps to deal with the unique properties of wholes which analysis "puts in relief." In the first place, such unique properties always presuppose nonadditive organization. That is to say, the sufficient condition of specific or unique properties in a whole is organization of parts in a way over and above the additive mode. When a whole is deliberately seen as nothing but a form of additive organization, its properties are only transcriptions of the properties of the elements in conjunction. Then the investigator takes account only of the features of the various parts and ignores the "unique properties of wholes."[76] Spaulding well describes this situation:

> It is an established empirical fact, that parts as non-additively organized form a whole which has characteristics that are qualitatively different from the characteristics of the parts. A simple and familiar illustration of this is the formation of water out of hydrogen and oxygen. The relation between hydrogen and oxygen is not additive, but organizing, and the characteristics of the water are not the same as are those of its chemical components. Also, the appearance of these new characteristics (of the whole) is not nullified by the hypothesis that they are potential in the parts in any sense; for, even if it be granted that this hypothesis does anything more than conceal our ignorance, it but repeats the problem in the form of the question as to how the existential appears out of the qualitatively different potential. On the other hand, if the hypothesis that there are non-additive relations, is accepted as an empirically established principle from which deductions concerning

75. See NR, 238.
76. See above, 25.

> specific instances can be made, then one can understand in just this sense the specific de novo appearance of certain qualities. "Things" added give merely a total of the same qualities as the parts have.[77]

Boiled down to bare essentials, Spaulding's remarks mean that if one grasps the properties of certain objects as parts and their mode of organization, he will be able in subsequent instances to predict the appearance of the specific and unique properties of the whole. To account for or to explain the whole's unique properties there is required empirical ascertainment "of the functional relation between the properties of the whole and those of the parts."[78] It is not a matter of deduction of one level from another but the relationship is ascertainable "only by inductive and empirical investigation."[79] At least, this is the trend of Spaulding's view on the analysis of such wholes as differ sharply from sums. Since all wholes whose parts are more than abstracted qualities or aspects that characterize the object, the relation of parts and whole is at most functional, and "reduction of these new properties to those of the parts in the sense of identification" is impossible without falsification.[80]

Secondly, Spaulding offers two possible metaphysical theories to account for the nonadditive results of organization, for the specific properties of wholes. Since these

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77. TNR, 447. (Ital. omitted)
78. Spaulding, Art.(1912), 240; See WC, 227.
79. Spaulding, TNR, 449.
80. See Spaulding, WC, 237: analysis is not explanation of the "higher in terms of the lower."

theories were explained earlier, it is not necessary to discuss them here.[81] What is noteworthy is Spaulding's reference to the specific and unique properties of a whole as a "nonrational element in nature." They are nondeducible "occurrences" in no sense identical with the properties of the parts.[82]

5. Conclusions about analysis and wholes.

(1) Some versions of analysis take no account of the unique and specific properties of wholes. "The nature and arrangement of the parts," says Perry, "supplies the character of the whole." With such a view there is no distinction made between analysis and division. And any distinction between wholes and collections somewhat loses its point.

(2) In Spaulding's view, analysis puts the specific and unique properties of wholes "in relief." Furthermore, the analyst recognizes that the specific properties of wholes are not strictly deducible from the properties of the parts in a certain relation. (In this sense they are "nonrational.")

(3) In Spaulding's version of analysis the specific properties of a whole have no special role in understanding it. They are merely other factors to be "analyzed out" along with the parts and relations. They have no more important in understanding the whole thanhave the parts and relationships. Whether and how they might have, in a synoptic method, is partly the subject matter of the next chapter.

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81. See above, 78.
82. Spaulding, Art.(1912), 240; WC, 237. See below, 124ff.

C. Summary.

By analysis "the problematic is discovered to be a complex of simples," a totality including the "combining relations." Unlike the positivists' linguistic analysis which only traces the formal consequences of propositions, neo-realists' analysis which is "the method of logic and of exact science" has "full ontological validity." Philosophy's main task is analysis of concepts as "complexes of simple terms of experience."(Perry) Analysis "presupposes that the nature and arrangement of the parts supplies the character of the whole." Perry analyzes "dependence" in wholes and finds they depend on parts but not vice-versa. With Spaulding analysis may be experimental (for "organic wholes," chemical or physical complexes) or in situ (for motion, time, space). Analysis reveals parts, relations and properties "the whole as a whole, may have different from those of the parts." (Omitted in Perry's view.) In situ analysis of time, for example, does not falsify because it leads to continuity and instants with a "quale different from the quale of the [spatial] point." Analysis of organic wholes does not falsify because it shows "organizing relations" and puts unique properties of the whole "in relief." Such properties, also referred to as a whole's specific properties, are a "non-rational element in nature.

Perry's assertion that dependence is nonreciprocal, that the whole depends on the parts but not vice-versa, is invalid. That a part cannot be a part without a whole is

equivalent to saying, Perry believes, "that the complex relationship of part and whole depends on the whole as one of its terms. And this is a case of dependence of whole on part and not of part on whole." He shifts the meaning of "whole." In the second clause whole is "complex relationship" where "whole" is a term or "part." But "part" is also a term and the "complex relationship" equally depends on the part. Since the relationship of whole and part is reciprocal, a complex cannot be destroyed without affecting the simple entities. If simple entities must be experienced in a complex or schematism, they cannot by this argument be proved independent of experience. To say an object "can be analyzed or divided" invites ambiguity. With division the object is treated as a sum. There is deliberate abstraction from all but 'more or less than' of the same thing. A division of salt leads to lesser salts. But in the realists' argument analysis leads to sodium chlorine, atoms, and finally molecules. In distinguishing between experimental and in situ analysis Spaulding seems to recognize that conceptual discrimination differs from discovery of parts; so he should not say that defense of the atomic theory involves defense of wholes like space and time.

Perry's truncated version of analysis("Nature and arrangement of parts supplies character of whole.") suffices for analysis in situ finding simples as abstracted qualities. It identifies the object by an empirical definition: a brick is a reddish, rough, heavy, rectangular object. Such

merely conceptual analysis cannot discover real parts, i.e. objects with features of their own different from the specific or unique properties of the whole. Scientific analysis finds such complex entities (parts) as atoms, genes, protons, etc. which are more than abstracted qualities or aspects. They are simpler than the original whole but not parts in the same way roughness is "part" of a brick or a point is a "part" of space. For the neo-realists the "validity of analysis" is really a thesis of their metaphysic rather than a methodological issue standing on its own feet. So their defense of the "validity of analysis" is question-begging because they have presupposed a special view of the real structure of things. Further, their defense entails the obvious and truistic idea that the truth of results of analysis is not identical with the verification of analysis.

In Spaulding's view, analysis puts the specific and unique properties of wholes "in relief." According to him, the analyst recognizes that the specific properties of wholes are not strictly deducible from the properties of the parts in a certain relation. (In this sense they are "nonrational.") But even here the specific properties of a whole have no special role in understanding it. They are merely other factors to be "analyzed out" along with the parts and relationships. They have no importance or privilege in understanding the whole. Whether and how they might have, in a synoptic method, is partly the subject of the next chapter.

CHAPTER IV

SYNOPSIS AND WHOLES

It is rather natural that synopsis should be defined in contrast to analysis. Philosophers who have defended synoptic method in one form or another have stressed the way it supplements and corrects analysis. Perhaps Plato's dialectical reason, which is often mentioned as "synoptic" reason, was intended to supplement and correct the method of Leucippus or some other pre-Socratic. Spinoza seems to have had such a relation to Descartes. And likewise Hume and Kant, Kant and Hegel, scientific naturalists and Goethe or Bergson go together in the history of philosophy.

A. Preliminary Definition.

W. R. Sorley's definition of synopsis, because it is comparatively explicit, will be a good starting point:

> Analysis sunders a thing into its elements; synthesis puts these elements together; synopsis views the thing as a whole. Synopsis is something more as well as something less than synthesis. Synthesis gives us a whole -- or perhaps only a collection -- each part of which is distinguishable and has been distinguished; synopsis contemplates a whole of which the parts may not be distinct.[1]

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1. MVIG, 250. See Brightman, ITP, 27: Synopsis "means the viewing of any object or complex of objects as a whole." In synoptic reason the mind does more than review the separate facts of deduction, analysis-synthesis, and intuition. "It sees them together and sees also the qualities of the object as a whole, which the other methods tend to omit, underestimate, or merely take for granted." See ibid., 110-114.

If one remembers Perry and Spaulding's view of analysis-synthesis, it is plain that Sorley's statement invites further probing and discussion. No exponent of analysis could accept Sorley's definition of it as sufficient. The question will presently be considered as to whether synopsis or any other method could contemplate "a whole of which the parts may not be distinct." Though parts at first may not be distinct, unless they are discoverable and recognizable as parts there can be no whole. It is thinkable that synopsis could be more than analysis, i.e., could contain a methodological feature to supplement and correct analysis. But it is not thinkable that synopsis could entirely exclude some method of finding parts, which is the primary purpose of analysis, and still deal with wholes. If synopsis were less in this sense, it would be just an "opsis." It would be a grasp or apprehension. But such an "opsis" is also included in analysis: Perry refers to the "immediate apprehension" of pre-analytic simplicity, and the neo-realists' version of space requires reference to its quale.[2]

1. Merz on synopsis.

Before trying to decide precisely what synopsis may add to analysis or what it should contain over and above

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2. See Perry, PPT, 41. See below, 106, on "preliminary synopsis. Cf. Spaulding, WC, 237. In Brightman's remarks on synopsis (See above, 100n) there is a more definite suggestion as to how it is "something more" than analysis. Whether that "something more" is the unique feature of synopsis will be discussed at length below.

analysis-synthesis, one may profitably examine other definitions and descriptions of it than those already given. Almost every discussion centering on synopsis refers to Theodore Merz as its exponent.[3] Merz, in turn, refers to Plato, Goethe, Comte, Hegel, Schelling, Ruskin, Wordsworth, and Sorley as synoptists. Many of these men were mentioned earlier in Chapter II.

In comparison with the analytic, abstracting, and isolating methods of the scientist, the characteristic procedure of the philosopher, Merz believes, is that of synopsis. In the nineteenth century, philosophy tried to take over the methods of science with the result that its vitality was sapped and it became lost in details.[4] If philosophy is to deal adequately with the inner life, with nature as a whole, and with novelty and individuality, it must cultivate the vue d'ensemble. But synopsis, Merz further cautions, is more than generalization. It stands in contrast to synthesis which is the obverse of analysis. As Goethe, Schelling, Hegel, and others have suggested, synopsis contains an element of intuitive penetration. It relies on poetic and artistic representation -- a viewing of things together as a whole which presupposes that the intuitive grasp of the artist supplements the analytic procedure of the scientist.[5] These problematic phases of synopsis were elucidated in previous remarks on Spinoza, Goethe, and Hegel.[6]

3. See Merz, HET, III, 103-105, 192-193; IV, 430ff. See Sorley MVIG, 250; Brightman, ITP, 27-29; Beck, Art.(1939), 339.
4. See Merz, HET, III, 103-104, 607-610.
5. Ibid., 610-612.
6. Above, 49, 53, 55.

2. How synopsis entails analysis.

In the foregoing paragraphs it has been suggested that synopsis entails analysis though it may bring to each problem "something more," some aspect of method that is more than analysis. Wilhelm Burkamp, for example, insists that "die synoptische Erkenntnis" has priority "vor der isolierenden Bestimmung der Einzelzusammenhänge." But the exact isolating method which finds its completest expression in "rationalism" must always supplement and accompany synopsis. Otherwise "Die Synopsis scheint nur das Verdienst zu haben dass sie Massen von Einsichten auf Kosten ihrer zuverlässigen Richtigkeit und der Richtigkeitskontrolle gibt."[7]

Again, Goldstein's remarks stress the complementariness of analysis and synopsis or rather seem, on the surface, to stress that complementariness:

> Scientific research is always founded upon analysis and, on the other hand, will never proceed without a certain synthesis. If one understands by synthesis the preliminary summary of the analytically gathered facts, nothing can be said against it....Such a procedure can be very useful for further research, particularly because it reveals the mistakes of the prevailing views -- the breaches in their theoretical bulwark. But it furnishes us with as little insight into the true nature of things as does the analytic procedure. Actually we must hold against the synthetic approach the fact that it does not confine itself to a preliminary synthesis, but claims itself as able to form a coherent and adequate picture of reality.[8]

From Goldstein's statements in Human Nature[9] one may infer

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7. Burkamp, SG, 283. Cf. Brightman, APR, 116-122.

8. ORG, 404. See ibid., 9; Goldstein, HN, 21, 23.

9. 3-6, 21-23.

that by "synthetic" he intends the "synoptic or holistic" method. But no synoptic thinker should be satisfied with Goldstein's version of the relation of synopsis and analysis. In the above quotation the only legitimate role of synopsis is that of synthesis, i.e., the survey of analytically gathered facts. Obviously then synthesis cannot be preliminary to analysis, nor can it be anything more than analysis-in-reverse. Apparently it is only preliminary to stating or verifying a theory. If Goldstein ever speaks of a method of investigating wholes that supplements analysis-synthesis, it is in the last sentence where he condemns the use of the "synthetic approach" alone. But no one should be seriously disturbed by Goldstein's last sentence. That synopsis cannot be "less than analysis" or cannot exclude some method of finding parts and still deal with wholes should be promptly clear to anyone.

Adequate comprehension of wholes requires rigorous conceptual discrimination of qualities or aspects and analysis into parts. For an object merely to be recognized as a whole, one must at least be aware that it is complex, that it is an organization in one sense or another, that it is something more than a simple abstracted quality. If synopsis is applied to this piece of paper as a whole, it must also be seen as complex in one of two senses. On the one hand, it may be seen as an organization of such properties as whiteness, smoothness, rectangularity, weight, and so on. These aspects or moments may be "analyzed out" by what has

been referred to as conceptual discrimination. Like analysis in situ, conceptual discrimination comes to rest in aspects, moments, or relatively primitive abstracted qualities.[10] On the other hand, this paper may be seen as consisting of parts discovered by a different mode of analysis: wood-pulp, rag, bleach, chemical elements, molecules, and finally electrons. All these parts have certain properties of their own distinct from those of the paper as "first seen." If the method of synopsis is applied to this paper as a whole, there must also be analysis of one kind or another to show how it is complex, how it is an organization. When the paper is delimited as a problem, one is vaguely aware that it has aspects, that it is a relation-relata complex. As a problem it is given as a vague whole. This diffuse awareness may be called "preliminary synopsis."[11]

Though it is apparent that synoptic method, if it is directed to comprehension of wholes, must entail analysis, it is not yet clear what synopsis should add to analysis-synthesis. Even the most rigid analyst thinks of his method as implying synthesis, the obverse of analysis different only in direction. Yet those who have concentrated most on

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10. See above, 28.

11. See Brightman, APR, 117ff. on the stages in synoptic method including "preliminary synopsis" and analysis. Like Goldstein, logical positivists have seemed hypercritical of synopsis because they fear it will try to move without analysis: "Die subjektive Empfindung," writes von Mises, "dass ein 'ganzes' sei...deckt nicht ein 'letzte Wahrheit' auf, sondern ist ein Ergebnis unkritischer Einstellung deren Funktion sich darin erschöpft, eine gewisse erste Orientierung auf einem bestimmt ungrenzten Gebiet zu liefern." (KLP, 325) Cf. Frank, KsG, 25 on the value of the "organische Naturauffassung" as preliminary orientation.

synopsis suggest that it is something more and something different from synthesis. Now it is necessary to find out what there may be about synopsis to make it a better method of explanation, especially a better method of comprehending wholes.

3. Synopsis and coherence.

For the sake of clarity and precision it is important to distinguish between synopsis and coherence. Among philosophers and logicians the term coherence has acquired two special uses, that of referring to a definition of truth or to a criterion of truth. To disrespect those uses is to invite ambiguity.

Truth is a property of beliefs and judgments. What, more precisely, is that property? It is the correspondence or one-to-one relationship of the belief to an object or state-of-affairs outside the belief. Bertrand Russell has defended such a definition of truth:

> If we take such a belief as "Othello believes that Desdemona loves Cassio," we will call Desdemona and Cassio the <u>object-terms</u>, and loving the <u>object-relation</u>. If there is a complex unity "Desdemona's love for Cassio," consisting of the object terms related by the object-relation in the same order as they have in the belief, then this complex unity is called the <u>fact corresponding to the belief</u>. Thus a belief is true when there is a corresponding fact, and is false when there is no corresponding fact.[12]

On the other hand, Brand Blanshard <u>defines</u> truth in terms of coherence: "The truth of a judgment does consist in the last

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12. POP, 202. See Spaulding, TNR, 423.

resort in its relations to a completed system."[13] But that completed system is not a system of judgments but rather it is reality, for thought "is its object imperfectly realized." The coherence theory of truth, like the identity theory, finally passes over into metaphysics. Or, rather, it is itself a metaphysical theory. It is not possible or feasible here to settle the question of the meaning of truth. That would require a final refereeing of the dispute between epistemological monists and dualists. What is to be noted is that one established meaning of "coherence" is truth as the absolute and ideally complete system of thought which is reality.

Many philosophers who differ on the meaning of truth agree as to its tests or criteria.[14] A somewhat eclectic statement of coherence as a criterion of truth would read as follows: A belief or judgment is true when it is self-consistent and is involved in an harmonious system of judgments ranging from general hypotheses down to empirical and evidential judgments. The belief, for example, that this is a piece of paper and not a thin sheet of white rubber is made true to a high degree of probability by a number of empirical judgments: This paper rips but doesn't stretch. It burns before it melts. It shows a water-mark. It submits to erasure. And so on. The application of coherence as a criterion usually

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13. NT, II, 270, 273. See Montague, Art.(1909) where there is a similar monistic theory of truth developed from the neo-realistic perspective: truth is "that particular form ofthe relation of identity" which subsists between the object of a belief and the content as existing. (546)

14. See Russell, POP, 217-218; Blanshard, NT, II, 259.

consists of verifying hypotheses: If this is a piece of paper, then it will rip, burn, have a water-mark, etc.

As Dewey says, the test of truth is not a mere formal subsumption of abstract particulars. "It is the capacity of the inferred idea to order and organize particulars into a coherent whole that is the criterion."[15] In a true judgment problematic facts -- evidential and directly empirical judgments -- are integrated with general ideas to merge into a coherent whole. When a proposition fulfills these qualifications, one can be sure to a probable degree that the object being talked about is as it is asserted to be.[16] It is possible, of course, to call such a criterion of truth synoptic because it stresses the togetherness or organization of judgments in a system as the test of any one problematic judgment. But synopsis is something more than a criterion of truth. It is a method of investigating any object of attention as a whole. Like analysis, synoptic method may require the coherence criterion for testing its results. For if its results are to become knowledge, they must be put in judgment form with palpably clear relation to other judgments as evidence.[17]

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15. LOG, 157. See ibid., 383, 391-392, 418, 394.

16. See Schilpp, PJD, 559 where Dewey himself seems to subscribe to the correspondence theory of truth.

17. To deny that data need formulation in judgments is to emphasize the fact that there can be meanings or referents without judgments, but it is to ignore the fact that the question of truth or falsity (and thus knowledge) cannot arise unless there are beliefs, assertions, or judgments. For an experience-content that becomes a referent to occur no judgment is necessary. When one asserts it is connected thus and so with other referents, the question of truth, knowledge, and evidence arises.

Standing in contrast to coherence, other tests of truth have been advanced which seem to be corollaries of logical analysis. The logical analyst is often inclined to shy away from system and coherence to find the truth or falsity of a judgment in its correspondence with simple facts, experiences, or sensation. More complex sentences are reducible to simple test sentences by logical operations in accord with the law of identity, but taking account of material assumptions and premises along the reduction route. Blumberg and Feigl, as trail blazers of logical positivism in America, advanced a criterion of truth that was purposely at loggerheads with coherence: "Working back from complex to simple we arrive at the immediate facts whose being-the-case constitutes the meaning of the proposition." Since meaning and truth-condition are identical, the single atomic proposition, as against the coherence theory, is true or false. This is determined by comparing the atomic proposition with "reality."[18] The main drive of the analytical position, then, is to the effect that individual and single propositions are true or false because they directly correspond with fact. Similarly, Bertrand Russell argues that most human knowledge is derivative, built up from intuitive knowledge or self-evident judgments (truths of perception and some universals) by strict deductive logic. In his view, self-evidence -- which allows isolate judgments to be true or false -- must supplement the criterion of coherence.[19]

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18. Blumberg and Feigl, Art.(1931), 288.
19. See Russell, POP, 170-172.

All philosophers who disavow coherence try to show that certain propositions can be determined to be true in themselves, apart from system. Hence, they rely ultimately on such criteria as correspondence with fact (e.g. atomic empirical propositions such as "This is red.")[20] or on self-evidence. But as Brand Blanshard has ably and validly argued, what is referred to as "solid fact" to which atomic judgments correspond is "another judgment or set of judgments, and what provides the verification is the coherence between the initial judgment and these."[21] The judgment that the cover of this dissertation is blue involves the hypothesis that if it is blue, it should match a certain area of the spectrum, it should appear green under yellow cellophane, etc. Unless one is merely naming or making a definition, the judgment "This is blue" clearly requires other judgments as evidence.[22] Again, the axioms of mathematics and postulational systems show that self-evidence is always a function of system. It is "the voice in explicit consciousness of systems that vary in magnitude and are achieved in varying degree."[23]

Paradoxically enough, the atomic verification that seemed to be a corollary of analysis in logical positivism has been "transcended" until contemporary thinkers of that school

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20. See Werkmeister, APS, 87.

21. NT, II, 228. See ibid., 228-233.

22. Mill's distinction between "belief" and "naming" is instructive: When we say that Negroes are woolly-haired we do not ordinarily mean to make know that "woolly-haired" is a name for every Negro "but that wherever the cluster of sensations signified by the word negro are experienced, the sensations signified by the word woolly-haired will be found."(AHM,164)

23. Blanshard, NT, II, 249. See ibid., 240-256.

make truth a syntactical concept, a function of a logical system: "A proposition is 'true' within a given system if it is consistent with the rest of the system."[24] Again, moving away from the position that judgments can be true or false in themselves in virtue of self-evidence or correspondence with fact, A. J. Ayer indicates how empirical verification at its very roots entails coherence:

> Empirical propositions are one and all hypotheses, which may be confirmed or discredited in actual sense-experience. And the propositions in which we record the observations that verify these hypotheses are themselves hypotheses which are subject to the test of further sense-experience. Thus there are no final propositions....When one speaks of hypotheses being verified in experience, it is important to bear in mind that it is never just a single hypothesis which an observation confirms or discredits, but always a system of hypotheses.[25]

To sum up this section: Synopsis, like analysis, is primarily a way of investigating objects to find out whether and how they are wholes. Coherence is either a definition or criterion of truth. Insofar as synopsis yields judgments about the nature of wholes, about the specific properties of wholes, about parts and organization in general, those judgments must be tested by the criterion of coherence.

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24. Russell, IMT, 174-175 on the relation of positivists' views to coherence.

25. LTL, 132-133.

B. The Uniqueness of Synoptic Method.

1. Synopsis and generality: "seeing things together."

Merz's view and remarks made by other thinkers of like persuasion often suggest that synopsis as "seeing things together" might mean something quite apart from emphasis on wholes and the whole-part relation.[26] Vue d'ensemble might be interpreted as a grasp of things in their most fundamental relationships or modes of togetherness. This is what Plato seemed to have in mind when he spoke of reason soaring beyond hypotheses to the "first principles."[27] But in this case, seeing things in their togetherness is seeing them as exemplifying certain laws or principles, as possessing certain common features. This is the method of logical abstraction par excellence. What more radical means is there for "seeing things in their togetherness" than logic or mathematics which are concerned with the minimum structure of any event? Scientific method, often cited as the epitome of analysis, also aims, within various fields delimited for practical purposes, at generality and seeing things in their togetherness.[28]

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26. See above, 101-102.

27. See above, 45-46.

28. See Brightman, APR, 118: "A scientific hypothesis is restricted to the ordering of the limited subject matter under investigation -- let us say the radiation of light or the religion of the Algonkins. A philosophical hypothesis, on the other hand, has a far wider scope and is synoptic in a very special sense, for it aims to relate the subject matter under investigation to a view of experience as a whole." Here "view of experience as a whole" may have two meanings:

John Stuart Mill has admirably and accurately described the way in which scientific method is analytic:

> In one case it is the order of the phenomena that is analysed and simplified; in the other it is the phenomena themselves. When the observed facts relating to the weight of terrestrial objects and those related to the motion of the heavenly bodies were found to conform to one and the same law, that of gravitation of every particle of matter to every other particle with a force varying as the inverse of the square of the distance, this was an example of the first kind....Water was found to be an actual compound of two other bodies, hydrogen and oxygen; substances very unlike itself, but both actually present in every one of its particles.... This last process is known by the name of chemical analysis; but the first mentioned, of which the Newtonian generalization is the most perfect type, is no less analytical. The difference is, that the one analyses substances into simpler substances; the other, laws into simpler laws. The one is partly a physical operation; the other is wholly intellectual.[29]

The generality of logic or mathematics, of course, is achieved at the price of the greatest possible abstraction from the empirical data, from the appearances of various things. As Whitehead says,

> The first noticeable fact about arithmetic is that it applies to everything, to tastes and to sounds, to apples and to angels, to the ideas of the mind and to the bones of the body. The nature of things is perfectly indifferent, of all things it is true that two and two make four.[30]

It may mean "rational interpretation" of all possible experiences and all possible <u>types</u> of experience. If this were taken as the unique contribution of synopsis, the only thing it would add to scientific analysis would be generality and comprehensiveness. The phrase is also heuristic, intended "to incite search for any possible property(ies) of the universe as a whole...to discover whether it is one whole or many wholes or a mere aggregation of atoms." (Letter to the writer, May, 1941)

29. Preface to James Mill, AHM, iv-vi.

30. ITM, 9.

If synopsis were merely the seeing of things in their togetherness as exemplifying universal principles, it would be hardly distinguishable from the aim of the analytical realists to "discover fine identities in place of gross differences," or to discover that the problematic is a complex of simples.[31] In fact, what are intended to show the togetherness of things any more than the realist's neutral entities and his scheme of basic relations? Perhaps for such reasons as these, defenders of synopsis have sought its unique contribution in something more than seeing things together in the sense of finding abstract principles and laws of maximum generality, which is pre-eminently the aim of analysis.[32]

2. Synopsis and the unique properties of wholes.

Rejecting the notion that the unique feature of synopsis is to be found in generality, Theodore Merz saw in synoptic method a procedure wherein "every object of contemplation...is a whole, a totality."[33] It was Merz's

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31. See above, 61.

32. See above, 101-102, 12.

33. Such a statement is, of course, a problem-raiser. (See HET, III, 612) First of all, not every "object of contemplation" need be a whole or totality. One can contemplate an abstracted quality such as whiteness or roundness -- or nonperceptible characters of a thing such as identity and unity -- without contemplating a totality. Certainly one can entertain in his attention the results of conceptual discrimination. But if the object is complex -- the prerequisite of its being a whole in any sense -- then the question arises as to what kind of wholeness is under consideration, as to whether the object is being seen from the

contention that analysis cannot deal adequately with wholes because it misses something in the whole. But synopsis entails an element of intuitive penetration like the artist's acquaintance with an object.* Such an element makes synopsis especially adequate for comprehending wholes. Criticizing Merz's view, Beck says: "In making synopsis a knowledge of wholes, he erroneously supposed that its distinctive contribution was an acknowledgment of an oversummative property."[34] Such a property is taken account of because synopsis does not exclude acquaintance. Furthermore, as was pointed out in connection with Sorley's definition of synopsis, acquaintance or a mere grasp of a quality-mass could not alone constitute synopsis if synopsis is to be adequate to an object as a whole. Beck makes the same point: "In cases [of acquaintance with an 'oversummative property'] which we do call synoptic experiences, we do not find the presence of an intuition to be essential to its being a knowledge of structural relationships of parts and wholes."[35] Thus, synoptic method must include analysis or some method of finding parts if it is to deal adequately with objects as wholes.

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perspective of conceptual discrimination as an organization of aspects, whether it is a sum, or whether it is a functional or "organic" whole. Even the most rigid analysts see every thing or existent as a "whole," i.e., as an organization of neutral entities in some relational scheme. And it is not incompatible with the analytic method to regard the entire cosmos as being a whole which is more than additive. See Beck, Art.(1939), 339: with synopsis not all things are seen as wholes.

34. Art.(1939), 340.

35. Ibid., 340.

* See above, 49-50, 53-54.

If one takes cognizance of the established meaning and usage of terms, he cannot find the differentia of synoptic method in the mere recognition of emergent qualities or the specific properties of wholes.[36] If a person wants to define synopsis exclusively in terms of such a recognition, there can be no quarrel with him. But analysts show how their method can do the same thing. Several times in the previous chapter it was noted that analysis reveals "those properties which, in some cases, the whole as a whole, may have different from those of the parts."[37] "Specific properties of the whole" is merely another way of saying "oversummative," emergent, or Gestalt qualities. The method of dealing with and interpreting such properties may distinguish synopsis from analysis. But one cannot in honesty follow Merz and say that analysis, especially as advanced by Spaulding and agreed to by other analytic realists, misses or ignores such properties.[38]

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36. See Brightman, APR, 118.

37. See above, 93.

38. Merz's criticism of analysis seems to apply especially to Perry's view. Though Perry speaks of the philosopher's intuitive insight and grasp of the "whole of things" (DP, 14-15), when he comes to analysis he says that "the nature and the arrangement of the parts supplies the character of the whole." See above, 65-71, 93-95.

3. Synopsis as "knowledge of an object as a part in its relation to some objective whole."

Taking the "togetherness" in synoptic method as a point of departure, Beck asks whether a given togetherness of elements, or any given whole, is objective or subjective. This can be determined by supposing that an object is a part:

> If it is a part of an object which is a real whole, it can be exhaustively explained only if in addition to its own intrinsic nature we study also its histrionic nature as playing a role in a determinable whole.[39]

What is this role played by the object as a part? Beck believes that if the object is "cast" in a real whole, there will be an empirically determinable difference to some of its characteristics. By referring to the next higher and lower level of complexity one may discover whether an object's "properties are intrinsic to it as oversummative to its parts, and whether or not there is some more inclusive whole which has an effect on it."[40] The criterion of real wholeness is the fact that an object is changed by being a part of such a whole.[41] In spite of first appearances this is really a theory to account for the specific properties of wholes, the collective properties which they may have distinct from the features of the parts. In the end Beck's argument is the same as Spaulding's: "nonadditive results of

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39. Beck, Art.(1939), 343. If "determinable whole" in the above quotation means, with Webster, "limitable," Beck's view does not seem to presuppose or imply absolutism. Objects must be examined in relation only to such wholes as are amenable to empirical operations.

40. Ibid., 345.

41. Ibid., 344 lines 17-22. It would have been illuminating if Beck had given some concrete examples.

organization" means that when parts are analyzed out or synthesized in, they are changed in certain respects.[42] There is another theory to account for the same fact: the parts remain the same but gain new properties at different levels. In any case, Spaulding believes that in "organic wholes" there are properties not deducible from or implied by those of the parts. This fact calls for "the empirical ascertainment in many cases of the functional relation between the properties of the whole and those of the parts."[43] In effect, Beck says the same thing:

> Philosophy will have to learn the same lesson with regard to it [the concept of whole] as it learned with reference to causality: whatis a real whole and what is a cause are matters for empirical investigation, and no amount of ratiocination alone will answer these questions.[44]

Beck agrees with one hypothesis advanced by Spaulding: when parts are analyzed out or synthesized in they are changed in certain respects.[45] That hypothesis is intended to account for the specific properties of the whole. When Spaulding and Beck speak of parts changing or gaining new properties, they are saying what was said in Chapter I: there are certain organizations of "things" (which from another perspective are organizations of aspects) with unique or specific properties

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42. See above, 96.

43. Spaulding, Art.(1912), 240. See above, 96-97.

44. Art.(1939), 345.

45. Yet Beck says that analysis, especially Spaulding's view, cannot determine "that an object may show properties when it is in a whole which it does not have when it is not a part." Thus Beck misinterprets the realistic thesis that analysis is not invention, that it discovers parts independently existing and does not affect what it discovers. See above, 91-92.

that mark the unity and "Eigendeterminierheit" of the whole.[46] In a "real," functional, or organic whole the presence of unique properties besides those of the parts is of distinct importance. In a functional whole such as an automobile one can separate the horsepower of the whole machine from the specific functions of the sparkplug; one can distinguish between the lassitude of a diabetic's gross bodily movements and the functioning of a single part of his body, his pancreas.

There is, as both Spaulding and Beck suggest, a functional relation between the collective and distributive properties that can be discovered only by empirical hypotheses: If sparkplugs in a certain number and with a certain adjustment of points are connected in a specific way with a motor head, pistons, crankshaft, battery, and carburetor -- then a certain average horsepower and speed will result. As many investigators have observed, explanation of wholes is much like causal explanation. It requires imagination, hypotheses, inference, and empirical observation -- all these frequently entail experimentation. No amount of mere conceptual discrimination could show, for example, that wood is a part of this paper or that ink from a typewriter ribbon is a part of these words as a specific sign-functioning. Such a discovery requires, as in the case of the causal relationship, direct or vicarious experience of certain factual connections.

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46. See above, 25-26, on Beck's view of sums and wholes' specific properties.

Everything Beck claims for synopsis is also included in analysis as defended by Spaulding and agreed to by his fellow analysts. Especially is material analysis able to show how being a part of an organic whole makes a difference to an object in the sense that it gains new properties or at least is the condition of specific properties of the whole.

4. Synopsis: The unique properties of a whole are nuclear to its nature and central to our understanding of it.

Up to now the differences between the analytic method and the so-called synoptic method of understanding wholes have turned out to be verbal differences. Everything that has been claimed for synopsis has also been included in analysis in one or another of its formulations. The analyst, it has been shown, is as interested in "seeing things together" as is the synoptist. What better way is there for "seeing things together" than the method of scientific analysis that aims to make the particular and individual event an instance of the general law? Furthermore, even the most rigid analysis thinks of his method as implying synthesis, i.e. seeing the togetherness of the parts. For synthesis is only analysis in reverse. Certainly one who has taken Humpty-Dumpty apart will know best how the parts must go together again.

Furthermore, the difference between the synoptic and analytic method is only verbal if that difference be located in the fact that synopsis, in contrast to analysis, takes account of the unique, specific, or "oversummative" properties of wholes. Spaulding's version of analysis, for example, is especially careful not to leave out the properties a whole may have which are "qualitatively different" from those of the parts.

Again, the difference between synopsis and analysis is only one of names when the former is taken to be "knowledge of an object as a part in its relation to some objective whole." This is Lewis W. Beck's version of synopsis. The criterion of "real wholeness," he says, is the fact that an object is changed by being part of such a whole. But Spaulding also says, defending analysis, that the unique and specific properties in a whole may be seen as a case of parts changing as they are analyzed out or synthesized into a given whole. And Spaulding agrees with Beck that to determine whether there is such a change, which is signalized by the appearance of unique and specific properties in the whole, requires "empirical ascertainment...of the functional relation between the properties of the whole and those of the parts."

Is there, then, any real difference between analysis and synopsis? Is the alleged difference between these methods of understanding wholes only one of labels? Earlier in this chapter it was observed that any adequate understanding of wholes must include some method of finding parts. On all sides

analysis has been accepted as the method especially devoted to showing how a given whole is composite, to revealing its parts and their nature. But defenders of synopsis have said that their method contains "something more" than analysis which makes it a better method for understanding wholes. In showing what that "something more" amounts to, the defenders of synopsis have not spoken clearly and unambiguously. In fact, all that has been claimed for synopsis over and above analysis has turned out to be included in analysis in one or another of its formulations.

If the difference between analysis and synopsis is any more than a verbal difference, one must be able to state precisely how the synoptic method differs from that procedure for understanding wholes which has gone under the name of analysis. Naturally we are not here interested in the multiplication of methods beyond necessity. If the method which has gone under the name of analysis is sufficient for understanding wholes, well and good. Then "synopsis" can henceforth be a synonym for analysis, as it has proved to be in most cases. Or it can well be dropped from the discussion of methods of investigation.

At the end of the previous chapter there were three main conclusions about analysis and wholes.[47] Those conclusions referred to a point made so often by synoptists, namely, that in a whole there are certain specific, unique, or "over-summative" properties which are either lost or ignored in

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47. See above, 96.

analysis. Now some versions of analysis take no account whatsoever of the unique and specific properties of wholes. "The nature and arrangement of the parts," says Perry, "supplies the character of the whole." With such a view of analysis there is no basis for distinguishing between division and analysis. And any distinction between wholes and aggregates somewhat loses its point.[48] This version of analysis is plainly inadequate. It blinks and shuts out something that belongs to the nature of a whole. It leads to distortion and a false view. Such a method may be sufficient for separating out the concrete qualities and aspects that together make up an "object" or "thing."[49] Perry's version of analysis may be all right for finding that concepts are "ratios or relational complexes of simple terms of experience." It leads to what Plato called "primeval elements " that have nothing but a name, i.e. to the abstracted qualities of a thing. But in regard to a whole this type of analysis must miss its essential features. It misses those specific, unique, or "oversummative" properties that mark the whole as a qualitatively unity. It misses those properties which make the whole one specific kind of thing even though its parts and their type of arrangement may be found in other kinds of wholes. When such analysis is focussed on water, for example, it overlooks water's transparency or special refraction, its particular weight, its solvent power,

48. See above, 22ff., 84ff.
49. See above, 16.

and other specific gross properties. The character of water, according to Perry's version of analysis, is exhausted in the properties of hydrogen and oxygen united in a certain way. Again, the salient organic traits of a living thing--its mobility, irritability, reproductivity, etc. -- are regarded merely as expressions of the nature and arrangement of parts. The properties of the whole organism are thus exhausted in such parts as appendages, stomach, intestines, cells, and finally hydrocarbon compounds. The nature and arrangement of the parts, says this version of analysis, strictly implies the character of the whole. After all that has been said in previous chapters about the nature of wholes, it should now be clear that this method is not an adequate one. It overlooks properties that are central to the nature of any given whole.

Spaulding's version of analysis puts the specific properties of wholes "in relief." He recognizes that a whole, of itself, may have certain properties that are "qualitatively different" from those of the parts and their arrangement. This version of analysis, like synopsis as defended by Merz and others,[50] does take account of a whole's unique, specific, or "oversummative" properties. Nevertheless in Spaulding's more liberal and adequate version of analysis the specific properties of a whole have no special role in understanding that whole. They are merely other factors to

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50. See above, 113-115.

be "analyzed out." They stand alongside and on a par with parts, their properties and arrangement. The "qualitatively different characteristics of a whole have no more privilege and importance in understanding it than do the parts and relationships.[51]

Is Spaulding's way of dealing with the specific properties of wholes enough? Is it enough merely to take for granted that such properties belong to a whole? If it is not, if the specific properties of a whole do have some special privilege and importance in understanding it, there is good historical reason for calling that emphasis "synopsis." Of all people who have been concerned with the way to understand wholes the "synoptists" have most often called attention to the specific, "Gestalt," or "oversummative" properties of wholes. They have persistently called attention to those "qualities of the object as a whole, which other methods tend to omit, underestimate, or merely take for granted."[52]

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51. See above, 77-78, 96. Spaulding also refers to the unique and specific properties of wholes as a "non-rational element in nature." By "non-rational" he means non-deducible. He means that the specific properties of wholes are empirical facts whose functional relationship to parts in a certain arrangement can be learned only from experience and experiment. Here, as with causality, pure deduction or "ratiocination" is not enough. It may be objected that there is something wrong with Spaulding's definition of reason if it so flagrantly excludes facts.(Cf. Brightman, IPKI, 19) To be sure Spaulding does not follow the Hegelian notion that experience is a function of reason. Spaulding's use of "reason" is the usual and historical meaning of the word, i.e. reason is insight into logical necessity. Spaulding would agree with Hume that no matter of fact is demonstrable; and the specific properties of wholes are simply matters of fact.

52. See above, 100n.

But in this respect the synoptist's ardor has often been equalled by the vagueness of his ideas as to how, exactly, the specific properties of a whole might have a place of special importance in a whole and for our understanding of the whole.

The best way to see the place of privilege which a whole's specific or unique properties have is to see how we go about understanding a whole. At the beginning of investigation the whole is a problematic complex. We guess that it is a whole. We have "a hunch" that it is a whole. But our information is no more precise than that because we do not yet know whether and how the object in question has parts.[53]

At the beginning of investigation the object before us is a problematic complex. How do we find its parts? We carefully note its appearances, its various qualities and properties. Then on the basis of experience or experiment we infer that the object must have such and such parts as sufficient ground for its appearances being as they are. We may have to compare its appearances with those of other objects, but this is only to help us make the inference to parts.

Some examples will make all this clearer. We start out with water as a relatively transparent, solvent, liquid

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53. The object in question need not, in fact, be a whole. That is, it may be a complex of qualities and properties which are as far as we can go. As was shown above (113n), not every object need be a whole in the sense of having parts which are themselves other objects. The ultimate entities of physical science, for example, have no parts. They are only complexes of such physical qualities as position and mass. Yet they may themselves be parts of real wholes.

mass. By noting how it turns to steam and how it reacts in the presence of other things we guess that it has certain parts. We perform the electrolysis experiment and determine those parts exactly. We determine that the parts of water are hydrogen and oxygen molecules in a certain proportion. But notice: Every stage of the analysis into parts was guided by the specific and "first seen" properties of water. Only by reference to those properties can we find out how hydrogen and oxygen are parts of water though they may also be parts of hydrogen peroxide. And only by reference to those properties can we test ouranalysis into parts. Though the parts may have their own properties and arrangement, the "qualitatively different" properties of water are nuclear to the understanding of it.

Similarly, on the basis of experience and experiment we infer that the parts of a brick are sand, cement, and fibrous binder; that the parts of an automobile are spark-plugs, crankshaft, pistons, and carburetor; that the parts of a living thing are its various appendages, muscles, nerves, and the like. But in all these cases the specific and "first seen" properties of the whole, or what we guessed to be a whole, guide our inference to the parts and finally verify those inferences. Toward those properties flies "the arrow of intelligibility."[54]

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54. For this apt phrase the writer is indebted to E. S. Brightman, but the present thesis was arrived at independently. With a method which ignores or minimizes the specific properties of a whole, "the arrow" flies in the direction of the parts in a certain arrangement. Thus most analysts achieve abstract generality at the expense of the whole's specific and individual nature.

We know that an object is a part only if we know that it, along with other objects in a certain arrangement, is a sufficient condition of certain properties by which we identify a given whole. The analysis of the whole into its parts is an attempt to infer correctly those grounds and conditions. This inference or analysis is guided and tested by reference to those properties which are seen, in the end, to be "qualitatively different" from the properties of the parts. In this sence the specific, unique, or "oversummative" properties of a whole are nuclear to its nature. Those properties make the whole one specific kind of thing even though its parts and their type of arrangement may be found in other kinds of wholes. They have a place of special privilege in understanding the whole. Toward them flies "the arrow of intelligibility."

We can now see in what respects Plato, Goethe, Spinoza, and Hegel anticipated a distinctive synoptic method. Those men said that there are features of a whole which must not be lost but must be preserved in a "concrete" view or scientia intuitiva. They opposed any view in which the highly abstract results of analysis are used to discredit or "explain away" the unique properties of wholes. The great value of their work, however, is in suggesting what not to do if you would adequately understand wholes. They provide a point of departure. They have laid out the problems. In these pages we have gone on to find the exact nature of analytic and synoptic methods in relation to wholes.

The title of this dissertation is a question: Does the understanding of wholes require both analysis and synopsis? To this question we must answer "Yes." The understanding of wholes <u>does</u> require something more than analysis as that method has usually been conceived. Besides analysis there is required synopsis in which the whole's specific properties are taken as nuclear in its nature and central to our understanding of it. Without analysis we could never know whether and how an object is a whole. Only by analysis can we learn of its parts and structure. But without synopsis, without taking into account the whole's unique and specific properties, we would overlook an essential feature of every whole and have no way of testing our analysis of the whole.

C. Summary.

Synoptists agree that their method of dealing with wholes differs from or supplements analysis. Certainly synopsis cannot entirely exclude some method of finding parts (the primary purpose of analysis) and still deal adequately with wholes. To understand specifically how a sheet of paper is a whole one must apply analysis, of one kind or another, to find that it is a complex of such aspects as whiteness and smoothness or to find it is a whole of parts such as wood-pulp, bleach, and finally electrons. Before determining what synopsis may add to analysis for truly adequate comprehension of wholes, one must distinguish between synopsis and coherence. To disrespect special meanings "coherence" has acquired -- definition of truth and criterion of truth -- is to invite confusion. The first meaning: "The truth of a judgment does consist...in its relations to a completed system," and thought "is its object imperfectly realized."(Blanshard) This view, like the neo-realist's, is a metaphysical theory. As a criterion of truth coherence means: A belief is true when it is self-consistent and involved in an harmonious system of beliefs ranging from general hypotheses to evidential empirical judgments. Against this criterion stands analytic reduction of complex beliefs to empirical "atomic" propositions which are indubitable and true-in-themselves. But "solid fact" or indubitable atoms are themselves beliefs and hypotheses whose confirmation requires "a system of hypotheses." (Ayer) Unless one is making a definition, "This is white"

involves, along with other beliefs, "That is red." When synopsis results in beliefs about wholes -- about their organization and properties -- those beliefs must be tested by coherence.

If the uniqueness of synopsis be sought in "seeing things together," then logicians, mathematicians, scientists (in fields pragmatically delimited), and neo-realists are synoptists par excellence. All "see things together" as exemplifying abstract principles. If the uniqueness of synopsis be located in recognition of specific, unique, or "oversummative" properties of wholes (Merz), then Spaulding must be called a synoptist. Again, to define synopsis as discovery of objective wholes by determining whether an object is changed when it becomes a part (Beck) adds nothing to Spaulding's analysis of "organic wholes" which also requires empirical operations. Thus far the difference between analysis and synopsis is only one of label. Historically synopsis has emphasized the specific properties of wholes but has been vague about them. Synopsis, as now interpreted, sees the specific and "qualitatively different" properties of a whole as nuclear to its nature and central to our understanding of it. By reference to such properties, our inference to parts (analysis) is guided and tested. Toward them flies "the arrow of intelligibility." Only by reference, for example, to water's specific properties such as transparency, particular weight, solvency, etc. can we justify our belief that its parts are hydrogen and oxygen with their own properties and particular arrangement.

CHAPTER V

SYNOPSIS AND SCIENTIFIC METHOD

In the first chapter it was noted that there is today in the philosophy of science a tendency toward "holism." The findings in various scientific fields are seen as evidence that "whole" is a primary category.[1] Such a metaphysical tendency becomes especially relevant to the purposes of this dissertation when it is seen as entailing a general shift in scientific methodology toward "synopsis" and "holistic" procedure. It may be well now to see how some of the conclusions of the previous chapter about the unique features of synopsis apply to practices in the various sciences. The following discussion is intended to give suggestions and examples of application. Attention will be given especially to those interpretations of scientific method that have something to do with synopsis as it has here been defined. In the previous chapter it was suggested that the special sciences may be synoptic but that it remains for philosophy to exploit the method fully.[2]

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1. See above, 1-10.

2. See above, 111-112, 125 and below, 138-39. Philosophy can more fully exploit synopsis because it is not limited to certain data as are the various sciences. Metaphysics is the attempt to formulate and verify hypotheses of the widest possible generality comprehending every type of experience. (See Whitehead, PR, 5-14) The various sciences, especially those patterned after physics, are incipiently metaphysical because they deal with "half the evidence provoded by human experience." "Science embodies," says Whitehead, "a rigorous scrutiny of one part of the whole evidence from which metaphysicians deduce their conclusions."(OT, 190. See 113, 134.

A Physical Science.

Natural science, Galileo believed, must start with "sensible experiments" and elaborate them through "necessary demonstrations." He believed that there is a harmony between mathematical truths and the occurrences of nature. The book of nature is written in mathematical language. Naturally, then, certain selected, refined, and measurable sense-data were alone "real." What could not be measured was excluded from scientific inquiry. It was the firm conviction of the fathers of modern physical science that only in so fat as knowledge entailed mathematical statement could investigators be free "des perpetuelles et stériles disputes."[3] They took da Vinci's advice to ignore the inner essences of things. They attended to exact formulation of relations and changes among certain selected aspects of experience. Galileo took a firmly phenomenalistic attitude:

> It does not appear to me at present to be worth while to investigate the causes of natural motion.... All that is needful is to investigate the properties of accelerated motion and define it in such a way that the momentum of the body increases uniformily in simple proportionality to time.[4]

And the intention or force of Galileo's thesis was later incorporated in Newton's "Hypotheses non fingo," in which <u>fingo</u> rather than <u>non</u> or <u>hypotheses</u> is the emphatic word.

See MoT, 211, 231-232. Thus, the appearances of purpose or "aim at value" in nature are, in the main, deliberately avoided by the scientist. The metaphysician can inquite into the connection of such appearances with the calculable structure of the world revealed by physicists. Metaphysical concepts are meaningful insofar as they have a <u>determinable</u> though perhaps devious relation to ordinary experiences and appearances.

3. See Duhem, Tp, 158, 163-164. Werkmeister, APS, 15-28.

4. <u>Opere</u>, VIII, 256 quoted by Cohen, RAN, 218.

1. The methods and aims of physical science.

What was characteristic of the method of Galileo and Newton is characteristic of exact natural science today, exact natural science patterned on the model of physics. As Lenzen writes in 1938, "The goal of exact empirical science is the expression of natural laws as functional relations between numerical values."[5] The space-time order, determined by "clocks" measuring rods, yield the data of exact empirical science. Causality means determination in accordance with natural laws that hold for the space-time order. Von Mises well describes what the causal principle has come to mean:

> In dem speziellen Fall, in dem es sich um Veränderungen messbarer Grössen handelt, kann man, wie wir oben sahen, die Kausalbeziehung auf die exakte Form von Differentialgleichungen bringen, wobei natürlich die Auffassung von den aufeinanderfolgenden "Ereignissen" schon aufgegeben ist.[6]

Modern science has steadily moved forward as investigators have remembered the "phenomenalism" of Galileo and Newton, as they have ignored inner causes and natures. It is not hard to show that every major blockage in scientific inquiry has been caused by illicit metaphysics in one guise or another. The history of modern physics, for example, is the story of a persistent effort to get away from models, pictures, and thing-notions implied in so-called scientific materialism. Or, again, the ether-concept illustrates the

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5. Enc., I, 5, 13. See ibid., 3, 37.
6. KLP, 173

"phenomenalistic" dialectic at work in science. It was manifestly a result of picture thinking or mechanical construction, to use Einstein's phrase.[7] The theory of relativity resolved the difficulties as it left the realm of thing-concepts for that of relation-concepts in the abstract arithmetical sense. In Cassirer's words: "Die Welt stellt selbst sich nicht mehr als ein Beisammen von Dingheiten, sondern als eine Ordnung von 'Ereignissen' dar."[8] All this took place through the organon of Galileo and Newton which had absorbed the notion of substantiality in that of function. The conclusions of Einstein or Schroedinger follow the path laid down by Newton and Galileo.[9]

Modern physicists have been as self-conscious about assumptions and method as Galileo was. They do not claim that their statements reveal things absolutely. Rather their assertions have a "rein anzeigenden Charakter." They are indices. The man whose discoveries made possible the electrodynamic picture of the world first stressed the need of interpreting exact natural science in terms of a symbolical rather than a copy theory. The views of Hertz -- to which Helmholtz, Mach, Duhem, and others have assented -- may be crystallized in the thesis that

> Die Grundbegriff der Naturwissenschaft erscheint jetzt nicht mehr als Kopien und Nachbilder eines

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7. See Einstein and Infeld, EP, 125. See ibid., 152 on the history of the "field" which follows Maxwell's equations but there are no material actors.

8. PSF, III, 552. See ibid., 545-546.

9. See Frank, EmP, 22; Werkmeister, APS, 203.

> unmittelbar dinglich Gegebenen; sondern sie werden als konstruktive Entwürfe des physikalischen Denkens eingeführt -- als Entwürfe, deren theoretische Geltung und Bedeutsamkeit an keine andere Bedingung geknüpft ist, als daran, dass ihre denknotwendigen Folgen stets wieder mit dem in der Erfahrung Beobachtbaren übereinstimmen.[10]

The exact scientist seeks to represent the necessary connection of certain selected and experimentally refined phases of appearances. Such representation requires a vast mediating scheme of assertions (usually symbolic) standing between conclusions and experiences. The indirection of physical theories -- their remoteness from ordinary appearances -- is suggested by Einstein's explanation of relativity "in a few simple words":

> I was once walking in the country on a hot day with a blind friend and said I could do with a drink of milk
> "Milk?" said my friend. "Drink I know; but what is milk?"
> 'A white liquid,' I replied.
> "Liquid I know," said the blind man, "but what is white?"
> 'Oh, the color of a swan's feathers.'
> "Feathers I know. What is a Swan?"
> 'Swan? A bird with a crooked neck.'
> "Neck I know -- but what is this crooked?"
> Thereupon I lost patience. I seized his arm and straightened it. 'That's straight,' I said. Then I bent it at the elbow. 'And that's crooked.'
> "Ah," cried the blind man, "<u>now</u> I know what you mean by milk!"[11]

The scientist's concepts -- mass, force, emergy, or electrons -- are "freie Scheinbilder" which copy nothing in immediate sense data but which are advanced so as to see the

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10. Cassirer, PSF, III, 25. See ibid., I, 24-26.

11. "Illustrative Anecdote," <u>Reader's Digest</u>, 38(1941), Number 230, June; 96.

world as lawful and orderly, and thus to be able to control it. "Une Loi de Physique," Pierre Duhem observes, "est une relation symbolique dont l'application à la réalité concrète exige que l'on connaisse et que l'on accepte tout un ensemble de théories."[12]

2. Physics, functional wholes, and synoptic method.

In the first chapter it was seen that scientists and philosophers think modern physical theories demand or imply an "organismic" perspective and something like a synoptic method. There is a tendency in physical science which gives credibility to such a thesis. Recent developments have shown, as Philipp Frank says, the impossibility of deducing the movements of minute bodies out of those of large ones, the substitution of statistical laws for individual ones, and the influence of a much wider circumstance than was formerly presumed.[13] In modern physical science the notion of "field" and Gestalt have thus come into the foreground. "The hopeless endeavour," says Whitehead, "to derive complexity from simplicity has been tacitly abandoned."[14]

The stable and persistent features of "matter" are now sought in the "field," which is the thought-object of modern physical science. Thus, interest has shifted to physical systems, Gestalten, or what were referred to in Chapter I as

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12. Tp, 254 (Ital. omitted). Cf. Einstein and Infeld, EP, 310-313.
13. See EmP, 24.
14. OT, 183. See MOT, 188, 192.

functional wholes. The criterion of a Gestalt, it was remarked earlier,[15] is its specific and "oversummative " character. This is the core of Ehrenfels' criterion whereby a melody is clearly more than the sum of tone impressions, the meaning of a sentence is more than the sum of individual words' meanings, and so on. It was natural for Köhler to find that "'Ganze' unter den Gegenständen naturwissenschaftlicher Forshcung vorkommen, die in solcher Weise 'mehr sind als die Summe ihrer Teile.'"[16] Any causal process in physical science may exemplify Köhler's thesis without transcending the actual mode of physical investigation to employ a special viewpoint. As von Mises notes, even mechanics can be seen as a Gestalt theory. What sane physical investigator, for example, would say that the image reflected by a mirror is merely thrown together from independent and separate reflections of single points and not determined by the object and its totality of optical properties?[17] For these reasons, then,

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15. See above, 20.

16. Köhler, PG, ix; see ibid., xix.

17. Von Mises, KLP, 317-319. In a logical analysis of Gestalt as a functional whole or Wirkungssystem Grelling and Oppenheim have found its distinctive feature to be interdependence as opposed to an aggregative whole. "Nonsummative" is not enough to characterize a functional whole, for some elements of a class of functions in a dependence system may or may not depend on their complementary classes. When they do, there is a causal dependence system, which is really the primary interest of Gestaltists. (See Art.[1939], 71-72, 75-76.) When they do not, there is still a nonsummative whole as was noted in connection with Spaulding's duscission of organic wholes. All this should suggest how the notion of Gestalt may play a role in physical science. Geometrical configurations -- certainly basic for fields and also basic for certain organic phenomena-- may be represented by giving the analytical equation of the corresponding distribution curve of distances. See Rashevsky, Art.(1934)2, 419 on Gestalten and functional analysis.

Werkmeister has suggested that "physical Gestalt" must be distinguished sharply from the type of wholeness found in living things.[18]

This tendency toward developing theories and concepts that involve fields and Gestalten suggests that physical science even within a very delimited scope and range of empirical data is synoptic: the physicists have not been content with earlier abstractions and have moved to higher levels of approximation and empirical adequacy. For example, Kepler's three famous laws were formulated on the basis of an assumption never satisfied in Everyman's world. Where can one find a system consisting of only two bodies? But higher levels of approximation in mechanics took care of complications; in the more complete modern theory of planetary motion Newton's laws can be derived from Einstein's ten algebraic equations of several thousand terms each when certain factors are reduced to zero.[19]

The notion of functional purposive whole[20] certainly may be connected with the physicists' conclusions. But the connection is established from outside physical science

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18. See APS, 358. Kurt Goldstein and Werkmeister are not altogether satisfied with Gestaltism. (See also McDougall, MM, 174-175; Meunziger, Art.[1935], 518-519.) At first the Gestalt theory, Goldstein observes, seemed to create an un bridgeable gap between the atomistic theory of physical events and mental processes. Though Gestalt interpretations seemed to close the gap, Gestaltists have not adequately understood the living thing's "constants" through the "conception of the organismic whole." (See Goldstein, ORG, 377-78, 381-388. But cf. Köhler, PG, xiii in answer.)

19. See Rashevsky, Art.(1934), 179-180; Werkmeister, APS, 224.

20. See above, 19-22.

through a metaphysical interpretation that considers basic cognitive needs -- what constitutes "sufficient reason" or adequate explanation -- and the relation of other types of experience to those in which the physicist is exclusively interested.[21] The previous discussion of the method of physical science and the continuity of modern and classical theories should suggest that no purposive organization could possibly be implied in physical theory. You cannot get in the conclusion what was deliberately excluded in the premises. Following this line, Frank defines "philosophical consequences of modern physics" as those which do not follow from the theory's physical content. And, in general, one must agree with him that physical science is itself neither materialistic, "organismic," nor idealistic but is logico-empirical.[22]

Hartshorne sponsors a "societal psychism" which is most intimately bound up with developments in contemporary science. He takes the "hints" given out by the scientists which lead toward organicism. The degrees of integration or "individuality" found in quantum theory is just what the organicist wants. With such statements there can be little quarrel, for it is true that theories of today have a certain Gestalt or "holistic" reference. But when Hartshorne goes on to say that the universality of final causes is illustrated in physics,[23] that the electrons' organic adaptation is "the

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21. See above, 131.

22. Frank, Art.(1939), 171-176, and the "empiricism," as has been shown, is a greatly abstracted one.

23. See BH, 190-191. Hartshorne explains further that the electron avoids boredom and achieves "vivid contrast" by

means to enjoyment of the ultimate values of feeling, harmony, and sympathetic participation," he is making assertions that cannot be justified by physical knowledge. They are "philosophical consequences" in the sense used above. From a strictly physical point of view they are nonsequiturs.

The notion of organism gets its teleological, aesthetic, or metaphysical filling from outside physics. To be sure, classical physics no longer has universal applicability. Other laws are needed for high velocities and sub-atomic phenomena. But the general schema for exact natural science is the same today as it was in the days of Newton or Galileo.

B. Synoptic Method and the Life Sciences.

Kurt Goldstein makes a very strong case to show that biology, and particularly psychopathology and physiology, need an "holistic" methodology. In discussing an individual's "coming to terms with the world," Goldstein, like Gordon Allport, is especially critical of efforts to see personality as "nothing more than a collection of hundreds or thousands of independent specific habits which may be determined

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pulsating in waves and being able to shift from one orbit to another! In Art.(1935), 290-295 Hartshorne expresses his views more exactly and circumspectly. Exact natural science, he says, cannot establish metaphysical ideas but can help to discredit some false ones.

statistically."[24] The knee jerk or the light reflex in the pupil of the eye, usually considered the prototype of reflexes, rarely show uniformity under natural conditions:

> A constant reaction -- corresponding quantitatively to the amount of light -- is to be achieved only under fixed conditions. Usually the reaction varies throughout, depending upon the differences in the mental and bodily condition of the entire organism.[25]

A change in any part of the organism affects reflex action, and at the same time the reflex changes the organism in a definite way. Along the same lines Goldstein, like Allport, criticizes Freudians for their hypostatizations (neo-faculty psychology) that often impede psychotherapy, for their belaboring of the genetic approach that ignores the contemporaneity of motivation and conflict, and for their overvaluation of the sex drive which is really an "auxiliary hypothesis" required by the partitive approach.[26] But Allport only hints at the philosophical issues: "There has set in a reaction against the search for mental atoms. The doctrine of the whole has won popularity."[27] In contrast, Goldstein

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24. Goldstein, HN, 120-121. See ibid., criticism of "drives," 146ff. Cf. Allport's condemnation (PER, 248-258) of specificists' attempt to "pulverize personality into minute constituent elements." Though such an effort makes easier experiment and explanation of cultural causation, it must miss the higher organizing units (e.g. moral qualities), and it has no basis in neurology.

25. Goldstein, HN, 122. Cf. ibid., 131 on Tolman's discovery of "catalyzing behavior" of rats.

26. Ibid., 161-167.

27. Allport, PER, 181-189. See 136-140, on the notion of Gestalt in physical science. "Doctrine of the whole" is, of course, a reference to Gestalt psychology. Closely allied with Gestalt psychology is the Leipzig school of Ganzheitspsychologie. "Die Kernlehre der Ganzheitspsychologie," says Hans Volkelt, "ist das Prinzip der unbedingten Unzusammengesetztheit des jeweiligen Erlebensbestandes und allen

always undertakes an epistemological critique: The Freudian mode of thought reflects the partitive and atomistic approach that in turn reveals prejudices of scientific methodology.[28]

Goldstein's view of the structure of personality is very similar to Allport's. In the former, "preferred performances" are the clues to capacities and constants of an individual's functioning. In the latter, traits are psychophysical systems which are telic in character. There is a difference, however, in their conclusions about the symbols and method adequate to investigation of personality. Allport believes that "mathematical symbols and neologisms" are really useless and dangerous. In the main Goldstein agrees as he speaks of the "qualitative nature" of a personality's interactional organization. The only thing that takes the edge off his "hope to discover by objective and mathematical methods [factor analysis] some consistent traits of personality" is the reminder that the individual proper or the whole personality should always be the point of departure.[29]

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seelischen Lebens überhaupt." Art.(1934), 1. This applies to "given" events as well as hypostatized ones. "Unzusammengesetztheit" is most clearly found in the description of immediate experience. No conscious content is a sum of elements or parts. Analysis reveals "Ganze" which are qualitative finalities. Hans Volkelt's history of this school shows its close alliance with the Gestalt point of view: Wundt anticipated Ganzheitspsychologie, Ehrenfels designated distinct types of Ganzqualitäten and in this respect was somewhat indebted to Mach's work of 1886, and William James's writings are full of notions intimately related to Krüger's holistic theory of "des wirklich Erlebten." (See ibid., 9-12, 42)

28. See Goldstein, HN, 167-168; Allport, PER, 235.

29. See Goldstein, HN, 188-189, Chapter VII; Cf. Allport, PER, 310-311, Chapter XII.

1. Synopsis and biology.

Goldstein's clinical and experimental work has helped him to formulate an appropriate method for biology which, he feels, must depart considerably from that of physical science. On the whole, exact natural science, if it follows the dicta prescribed by da Vinci and Galileo, is, Goldstein believes, a procedure that moves "atomistically," by dissection, isolation, and analysis.[30] He believes that all this is necessary but not enough. Physical science results in a symbolism which is essentially alien to the phenomena of observation. Its methods are still too much concerned with abstractions to be of real help to the biologist.

a. Kurt Goldstein on method.

In biology, Goldstein urges, the notion of "the organism in its qualitative organization and holistic functioning" is the basis of biological knowledge and the criterion of factual relevance. The true constituents of the organism are discovered by the observation of "preferred performances." As Goldstein says, relating his view to that of the Gestaltists:

> In the light of our general view, the tendency toward the good Gestalt finds its explanation as an organismic phenomenon. The explanation lies in the tendency toward preferred behavior, which is the essential prerequisite for the existence of a definite organism.[31]

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30. HN, 28, 21. But see above, 136ff.
31. ORG, 378. (Ital. omitted.)

Such views imply that biology needs a partly sui generis method. Goldstein believes it must be a form of creative activity whereby the investigator builds a picture of the individual phenomenon through "a form of ideation similar to the procedure of an artist." Goethe called such a procedure Schau. The "picture" was called the Urbild.[32]

In physical science the copy-theory of knowledge has been given up for the symbolic. Goldstein refers to Cassirer and Duhem as emphasizing the role of creative imagination informing conceptual structures far removed from immediate day-to-day experience. Biology also needs creative imagination in a somewhat different direction:

> In biology symbols, theoretical representations, must in principle include quality and individuality in all their determinations. Biological descriptions must exhibit a definite qualitative organization.[33]

The parts of an organic whole can never be understood merely quantitatively. Every fact has a qualitative significance. The tools of mathematical natural science must be supplemented by approximation to a prototype, the Urbild of the organism.[34] This point of view was anticipated in the controversy between Cuvier and Saint-Hilaire. One clung to the dissective way, and the other made the Idea or "organismic principle" his guide. Goldstein would do as Goethe did:

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32. See Goldstein, HN, 23-25; ORG, 401-402.
33. HN, 29; ORG, 413.
34. See Goldstein ORG, 409. But cf. Goldstein's remarks above on mathematical analysis of personality factors, 142.

> A biologist must possess the faculty of combining both points of view, although he may not admit it. In other words, he must at one time use the dissective approach, at another, the holistic.[35]

Does the holistic approach require substantial vitalism: Goldstein believes not. In fact, substantial vitalism is usually an ad hoc or auxiliary hypothesis required by exclusive use of the analytic method. Driesch's notion of entelechy is too vague and irrelevant to scientific results to be admissable.[36] Furthermore, if teleology is anything more than heuristic, it is, Goldstein believes, scientifically irrelevant. Goldstein agrees partly with Unger and von Baer that "end" should be thought of as a direction of activity and not a consciously intended task. The idea of a definite end (the actualization of an organism's "essence") may be highly fruitful for scientific comprehension.[37]

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35. ORG, 414. See Chapter II, 53, on Goethe and synopsis.

36. Substantial vitalism has valuably called attention to the highly integrated complexity of organic life and its creative development. Nevertheless, vitalism offers no precise explanation of these appearances except to postulate entelechies or vital forces which have little or no ostensible connection with them. Driesch explains that entelechy is non-physico-chemical but positively an elementary agent found in nature. It has nothing in common with spatiality, quantity, mass or energy. Still, in material systems the entelechy is claimed to have effects through its suspensory power which is "absolutely nonergetic" and sui generis. (See Driesch, POI, 33-39, 32) The entelechy, says Needham somewhat harshly, belongs to pre-Boylian biology. (OL, 77-78, 71) Cf. Cohen, RAN, 273; Werkmeister, APS, 360-362; von Mises, KLP, 268-269: Even if biology requires unique theoretical "Hilfsbegriffe," there is no need to step out of the realm of empirical investigation.

37. See ORG, 424-425; see above, 126, describing Werkmeister's view of the use of concepts such as "purpose" in biological investigation.

Like synopsis Goldstein's method makes the organism's specific qualitative organization, its constants, the guide of analysis and the means of understanding parts. In both psychology and biology the individual's "constants" make the function of its parts intelligible. Goldstein defines constant primarily in reference to psychology:

> We may call the preferred way of execution a constant of the individual. Ultimately these constants are basic traits of the constitutional and character make-up of the individual.[38]

The term "constant" is equally necessary for biology.[39] It is only in reference to the individual's constants that the functioning of parts under natural conditions can be understood. Those investigators who try to understand the individual in terms of the functioning of isolated parts, find it continually necessary to bring in ad hoc hypotheses and auxiliary factors. The sexual organs and digestive apparatus, for example, are parts of such a living thing as a person, a dog, or a rat. To understand these parts, their specific relations and activities, it is necessary to refer to the individual's constants:

> A normal organism...is able to repress the hunger feeling or the sex urge if it has something very important to do, the neglect of which would bring the whole organism into danger.[40]

Goldstein's method is thus application of synopsis in biology and psychology.

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38. HN, 184. See ibid., 193. See above, 138n.
39. ORG, 377-378; 381-388.
40. Goldstein, HN, 143.

b. Rashevsky on method.

N. A. Rashevsky notes that the common excuse for the lack of a consistent system of mathematical biology is the complexity of organic phenomena. Yet on the face of things physical events appear so complex that exact mathematical treatment seems impossible and out of the question. Rather, the complexity of organic events, Rashevsky contends, is an argument for the use of the mathematical method. An epitome of the mathematical biologist's habits is found in Rashevsky's statement:

> The important thing in mathematical method is to abstract from a very complex group of phenomena its essential features and thereby simplify the problem. The more complex features are then taken care of gradually, according to the degree of their importance and complexity as second, third, and higher approximations. True, by abstracting, we lose, so to say, contact with reality; but no harm is done as long as we keep it in mind.[41]

And as long as "we keep it in mind" inquiry moves to ever higher levels of approximation and empirical adequacy just as the more complete modern theory of planetary motion represents a higher level of empirical approximation from which Newton's laws can be derived when certain factors are reduced to zero.[42]

What happens when the operations described above are actually applied to living things? On the first level of approximation the nucleus-cytoplasm as well as the cells' functioning and mode of multiplication are eliminated as too complex. The investigator concentrates on what is common to

41. Rashevsky, Art.(1934), 178.
42. See ibid., 179-180. Werkmeister, APS, 224-225, 364, 365.

all cells. A cell is viewed as a small liquid system in which certain chemical reactions occur that result in growth.[43] After this the investigator occupies himself with the precise physical conditions for absorption and secretion of substances in relation to the permeability of the cell surface and chemical reactions. "The conditions of growth of a cell," Rashevsky says, "can readily be stated mathematically by requiring that the total amount of food substances consumed per unit time should exceed that of secretion substances produced."[44]

Further inquiry leads to other levels of approximation where the concern is surface tensions and conditions of cell division (calculation of the critical size for division in terms of permeability, temperature, rate of metabolism, etc.). Subsequently the scientist must attend, using the same basic schema, to types of cells, to irritability, and so. Rashevsky even goes so far as to make suggestions about the mathematical relation between character and bodily constitution.

In spite of his rigorous application of the mathematical method and functional analysis, Rashevsky recognizes that

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43. Note always the levels of approximation and conditions of reduction. Compare this with the subsequent discussion of the basis of "creativity." Woodger's remarks in BP (235-236) are not in contradiction to Rashevsky's views as to the modus operandi of strictly scientific biology. But Woodger is anxious lest the use of mathematics lead to content-physicalization. (BP, 235)

44. Art.(1934), 184.

the aim is to explain rather than "explain away" specific and unique properties of the living whole. The specific properties of the organism as a whole are the primary frame of reference. Various parts are to be understood as parts only by reference to the total features of the organism as "first seen." Rashevsky's method is the antithesis of reduction.[45] Like synopsis it aims, within a delimited subject matter, to "save appearances" in explanation -- inquiry must ever move to higher levels of approximation.

In reference to synoptic method, Rashevsky's views are similar to those of Needham who seeks causal generalizations as valid as those of physics and chemistry but with a different content.[46] Thus, McDougall misrepresents when he says without further statement that Needham relies primarily and exclusively on "mechanistic explanation." Needham's views

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45. Werkmeister claims that the positivists' reduction to the thing-language (the everyday language: "This is hot." "This is brown." "The lump of lead is heavy.") and their physicalism thesis inevitably entails a content-reduction. (See Werkmeister, APS, 363-364; Art.[1940], 384-385.) But Carnap and von Mises have argued explicitly that their thesis entails no such reduction. In the Encyclopedia Carnap notes that "Biology presupposes physics but not vice-versa." The language of biology contains the physical language as a sublanguage, but has its own unique elements. (Enc., I, 1, 46, 45-55.) Again, von Mises speaks for the positivists: "Wann sollten wir also verlangen, dass alles, was in anderen Wissenschaft behandelt wird, sich auf Physikalisches zurückführen lasse? Sowiet der Physikalismus in diesem Sinne gemeint ist, müssen wir ihn ablehnen." (KLP, 146. See ibid., 365-372.) For the logical positivists, then, physicalism means linguistic reduction and "meaning" becomes an intralinguistic matter: Meaningfulness is Verbindbarkeit -- a proposition is meaningless only if it contradicts the rules of a given language. (See KLP, 63-74; Morris, Enc., I, 2, 15-16, 41.)

46. See OL, 164-165.

follow very closely the fundamental consequences of dialectical materialism for biology.[47] That is to say, biological order is a "new dialectical level," a form different from those found in physics, chemistry, and crystallography. Mechanistic materialism -- Prenant, Zanadovsky, and other Marxists or "left Hegelians" have insisted[48]-- is as much illicit metaphysics as is vitalism. The question is one of levels of scientific laws, and this has an important meaning for the whole-part relation as was suggested in the previous chapter. For example, the specific properties of living things are their self-direction, integration, regulation, and at the same time diversity of processes. Whitehead has summarized these features under "creativity." Now the specific or collective properties of the organism may be found by material analysis to have a functional correlation with the internal structure of the germ and finally in the intra-atomic structure.[49]

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47. See Needham, OL, 44-47. Needham makes the interesting observation that the dialectical position was anticipated by Coleridge in his "Essay Toward Formation of a More Comprehensive Theory of Life" (Miscellanies. London: Bohn, 1885) Coleridge believed that life involves the same powers we recognize under other names -- electricity, chemical affinity, etc. -- but so organized as to be the conditions or organic appearances.

48. Cf. Emery, Art.(1935), 11-12: "Mechanists do not recognize the hierarchy of the sciences and believe in the possibility of a reduction of the complex laws governing the behavior of a society and living matter to the simpler physical chemical laws and these in turn to the most simple laws of mechanical motion....The dialecticians on the other hand consider the world process as a creative and synthetic one." Both Engels and Lenin noted that there is a contact between the biological and physical level but that "the higher is inevitably a new thing, which cannot be explained by the simple sum of the 'elements.'" Cf. Somerville, Art.(1938), 232-33.

49. See Lillie, Art.(1934), 302, 309.

The ontogenetic process owes its stable features to intranuclear genes which are "directive." In contrast to the homogeneity and symmetry in nonliving systems (for example, the mixture of compounds in simple solution) organic transformation is asymmetrical. This asymmetry has a basis in in atomic and molecular behavior as shown in the predominating influence of asummetrical compounds in synthetic metabolism (for example, in the production of amino acids which are "building stones" of proteins). Pasteur, in fact, regarded the tendency toward asymmetric synthesis as the outstanding distinction between the chemistry of living and nonliving systems. It is responsible for the increasing complexity and diversity of development that express themselves on a large scale as "creativity."[50] The hypothetical entities and parts, which are discovered to explain certain "large scale features" of the organism, get their specific meaning as parts from their relation to the gross specific properties of the whole organism. The atoms and their asymmetrical behavior are the underlying and sufficient condition for the organisms having all those properties summarized in the word "creativity." Their discovery marks a "qualitative difference" between the properties of the whole and those of the parts in a certain arrangement. There is no question of reducing the former to the latter. In fact, Rashevsky follows the synoptic viewpoint and suggests that inquiry and the "arrow of intelligibility" should move in the opposite direction.

50. See Lillie, Art.(1934), 304. See ibid., 309.

2. Historical sciences.

A "holistic" and synoptic approach such as that discussed above may be necessary for all life-sciences and Geisteswissenschaften. Morris Cohen, for example, seems to believe that it is. After criticizing the attempted content-reduction of social-historical facts to simply physical or biological data, he concludes that the social in contrast to natural sciences demand a "teleologic point of view which describes movements in terms of their goals." They demand a holism implied by the means-ends relationship which "is a special form of that between parts and wholes."[51]

On this point John Dewey seems undecided. In his chapter on "Social Inquiry" in the Logic he vacillates between a teleologic holism and physicalism. Though social sciences should generally follow the physical in instituting a "conjugate correspondence of factual and conceptual subject-matter," their data, qua social, cannot be attacked directly. They depend upon "extensive prior knowledge of physical phenomena and their laws."[52] No one does anything except in physical circumstances so social sciences are not exclusively or dominantly psychological. Dewey tends to deny any autonomy for the temporal-psychological dimension of purposes and desires -- emotions and purposes are existents in the same sense as stones, stars, and oysters.[53] Everything

51. RAN, 343, 346.
52. See Dewey, LOG, 491-492.
53. See ibid., 492, 492n. "A person is an object, not a 'mind' or consciousness." (525)

that exists is in physical space and time. Yet social phenomena do have a novum, something "historical, or of the nature of individual temporal sequences." The emphasis on "individual temporal sequences" in social phenomena is a significant emphasis, but for Dewey it often seems to be little more than a challenge to physicalize the social phenomena in distorting reduction and a killing shave with Occam's razor.

Nevertheless, Cohen's remarks, and sometimes Dewey's, suggest that adequate and honest comprehension of social organizations as functional-purposive wholes entails synopsis. Otherwise there is a tendency to assimilate those wholes to forms of biological and even physical organization. Certainly a social whde has parts -- persons, material objects such as tools and signs, industries, and the like -- with properties of their own. But to understand them fully as functioning parts, they must ever be related to the specific properties and features of the whole which are really the defining properties that show the oneness of the society in contrast to the multitude of the parts. As Emery, the dialectical materialist has written, "Men are subject to certain biological laws, but society as a unit has its specific laws which are neither the sum, nor the continuation, nor the combination or modification of the old elements."[54] It is the new elements, "specific laws" or collective properties, which provide the primary and distinguishing referent of the term "society." They are not, of course, the exclusive

referent, for a society is a complex thing with parts of many kinds and functions.

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54. See Art.(1935), 27.

C. Summary.

Scientific methodology is shifting toward synopsis. Though physics does and should follow the phenomenalism of Galileo and Newton, the notion of "field" or functional whole has become central. Physicists abandon earlier simplicities and abstractions for the sake of greater empirical adequacy. (Frank; Whitehead) Thus, there may be greater concern for "individuality," but the reality of purposive and "realizing" organisms is not implied (Hartshorne) in physics. In psychology "The doctrine of the whole has won popularity." (Allport) The view that personality is a collection of independentspecific habits and the Freudian mode of thought are being abandoned in may quarters for understanding in terms of an individual's "preferred performances" or traits (telic systems). The notion of "the organism in its qualitative and holistic functioning" should be taken as the basis of biological knowledge and the criterion of factual relevance, so the biologist needs symbols that "include quality and individuality."(Goldstein, echoing Goethe) But biology also needs exact analysis. Though by abstracting mathematical biology may seem to lose contact with reality "no harm is done as long as we keep it [the abstracting] in mind" and move to higher levels of empirical adequacy and approximation. (Rashevsky) Even this method aims within a delimited subject matter to "save appearances." Along these lines dialectical materialism and logical positivists' "physicalism" are quite compatible with synoptic evaluation of an organism's

specific properties: "Creativity," direction, and regulation. Again, social-historical facts are seen to require a "teleologic point of view" (Cohen) since they contain something over and above the physical or biological level, something "of the nature of individual temporal sequences." (Dewey)

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ABSTRACT

The "holistic" and "organismic" philosophies of Smuts, Whitehead, Lossky, and others raise the central problem of this dissertation: Does the understanding of wholes require both analysis and synopsis? (The writings of Lewis W. Beck advance this problem in important ways. He shows that synoptic method must be something more than "acknowledgment of an oversummative property" in wholes and that understanding a whole requires experience more than mere "ratiocination.") Analysis ordinarily means resolving an object into parts and seeing the relationship of parts originally in the whole. Etymologically synopsis means seeing things together, which might be merely synthesis or analysis-in-reverse. This dissertation presents a different idea. It maintains that with synopsis the finding of parts in a whole is guided and tested by reference to the unique (Gestalt or "oversummative") properties of the whole in distinction from the properties of its parts.

Some writers have defined "wholes" as ranging from sums or aggregates through spatio-temporal "wholes" and "substantial wholes" to causal and purposive organizations. Any whole, i.e. any plurality-seen-as-a-unity, may indeed be regarded as a sum or aggregate if you take account only of its elements and their properties, numerically conjoined. But a whole differs from a sum or aggregate in that it has as a fact certain unique (Gestalt or "oversummative") properties distinct from the various properties of the parts. For example, the

specific properties of an automobile -- its speed, horsepower, and social usage -- mark its unity in contrast to the plurality of parts such as sparkplugs, pistons, fan, and wheels. The parts of a whole are such objects as are found to be the condition of the whole's unique and specific properties. "Parts" should not be confused with qualities or aspects which, taken together, constitute a given object. The qualities of a brick are its brown color, box-like shape, and smooth surfaces. Its parts, however, are sand, fibrous binder, and cement in a certain arrangement. Thus spatial, temporal, or "substantial wholes" in themselves are to be seen as complexes of various qualities or aspects. But a whole, properly speaking, is a causal or purposive complex of parts, of objects or processes found in experience to have their own properties and found to be conditions of the whole's having such and such specific properties.

Questions Arising from Historic Views. Explanation, Plato says, is "enumeration of the elements out of which anything is composed." But when he "explains" a wagon by enumeration of the planks (parts), these elements are not in the same category as primitive qualities or "primeval elements" which "have nothing but a name." Plato says that the dialectical thinker is synoptical. "Understanding," he believes, moves upon hypotheses and images but "reason" soars beyond to "the first principle of the whole." How, specifically, are Plato's dialectical or "synoptical" reason and his explanation through "primeval elements" related to the understanding of

wholes? Spinoza's scientia intuitiva raises the question: What is the place of intuition in comprehending wholes? In more recent times Hume used analysis to show that substances are nothing but a complex of experienced qualities. His method raises the question: Is the type of analysis which separates out qualities and aspects of a thing adequate for dealing with wholes? After Hume, Kant believed that there is something in organisms which cannot be analyzed in the same way as abstract spatial wholes. Goethe endorsed his view as "ein Bild seiner eigenen intuitiven Geistesrichtung." Goethe wanted the poet's "anschauendes Bewusstsein" of a whole as well as the scientist's tight analysis. We must ask: How are the two related? With Hegel "Reason" aims to achieve the "concrete universal," the progressive organization of experiences. Synopsis, in contrast to analysis, is often linked with the "concrete" view that takes all facts into account. But how, specifically, is synopsis "concrete"?

Analysis. By analysis "the problematic is discovered to be a complex of simples" plus "combining relations." Unlike positivists' "linguistic analysis" this neo-realistic version of analysis is concerned with the nature of things rather than language. Analysis, Perry says, "presupposes that the nature and arrangement of the parts supplies the character of the whole." But with Spaulding analysis reveals parts, relations, and unique properties which "the whole, as a whole, may have different from those of the parts." Material analysis, he believes, is adequate to deal with organic wholes

because it shows "organizing relations" and puts "in relief" a whole's unique properties.

It is confusing when a champion of analysis says that an object "can be analyzed or divided." With division an object is treated as a sum. There is deliberate abstraction from all but 'more or less than.' Dividing salt gives less salt. But analysis leads to sodium and chlorine atoms and finally to electrons. By "in situ" as against "material" analysis Spaulding recognizes that analysis into qualities differs from analysis into parts. So defense of the atomic theory does not, as he believes, involve defense of "wholes" like space and time. Perry's narrower version of analysis, like "analysis in situ," may suffice for separating out an object's various qualities. But it mistakenly presupposes that the character of a whole is exhausted in its parts and arrangement. Spaulding's more adequate view puts "in relief" those properties in a whole that are "qualitatively different" from the parts. (Those properties are "non-rational" because they do not follow from the properties of the parts with logical necessity.) But even in this version the unique and specific properties of a whole have no special privilege or importance in understanding it. They are just other factors to be "analyzed out."

Synopsis and Wholes. Synopsis must include some kind of analysis if it is to deal adequately with wholes. One kind of analysis will show that a sheet of paper is a complex of such qualities as whiteness and smoothness. Another kind will

show it to be a whole of parts such as wood-pulp, bleach, and finally electrons. Synopsis should be distinguished from "coherence." To disrespect special meanings "coherence" has acquired is only to invite confusion. "Coherence" may be a definition of truth: A judgment's truth is "its relations to a complete system," says Blanshard. And thought "is its object imperfectly realised." This view, like the neo-realist's, is indirectly a theory of the nature of things, a metaphysic. "Coherence" may also be a criterion of truth: A belief is true when self-consistent and involved in an harmonious and inclusive system of beliefs ranging from hypotheses to evidential judgments. Against this criterion stands analysis of complex beliefs into empirical "atomic" propositions which are supposedly true-in-themselves. But these latter propositions, unless they are cases of naming, are themselves beliefs whose confirmation further requires a system of beliefs. Unless one is merely naming, the proposition "This is white" involves, along with other beliefs, "That is red." When synopsis results in beliefs about wholes, those beliefs must be tested by coherence.

If synopsis be distinguished from analysis solely in that it "sees things together," then mathematicians and neo-realists are synoptists par excellence. They "see things together" as exemplifying abstract principles. If synopsis be distinguished as mere recognition of the unique or "oversummative" properties of wholes (Merz's view), then Spaulding must be called a synoptist. Again, to define synopsis as

discovery of "objective" wholes by determining whether an object is changed when it becomes a part (Beck's view) adds nothing to Spaulding's version of analysis which also allows an object to change on becoming a part and also requires empirical operations. On all these points the difference between analysis and synopsis is only one of label. There may be, however, a real difference between those methods in the way they treat the unique and specific properties of wholes. Analysis in some of its versions ignores those properties. At best it puts them "in relief" and on a par with parts and order in the whole. Historically synopsis has emphasized the specific properties of wholes but has been vague about them. Synopsis, as now interpreted, sees the specific and "qualitatively different" properties of a whole as nuclear to its nature and central to our understanding of it. By reference to such properties our inference to parts (analysis) is guided and tested. Toward them flies "the arrow of intelligibility." Only by reference, for example, to water's specific properties such as transparency, particular weight, solvency, etc. can we justify our belief that its parts are hydrogen and oxygen with their own properties and particular arrangement.

Synopsis and Scientific Method. Scientific methodology is synoptic at several points. As physicists abandon earlier simplicities, the notion of "field" or functional whole becomes central. In psychology, says Gordon Allport, "The doctrine of the whole has won popularity." Since "the organism

in its qualitative and holistic functioning," says Goldstein, should be the basis of biological knowledge, symbols must include "quality and individuality." Though, by analysis and abstraction, mathematical biology may seem to lose contact with reality, Rashevsky believes that "no harm is done as long as we keep it [the abstraction] in mind" and "save appearances" by moving to higher levels of taking in the facts. With the synoptic use of the organism's unique properties and constants "dialectical materialism and logical positivists' "physicalism" are quite compatible. Again, there is a synoptic emphasis in Cohen's idea that social-historical facts require a "teleologic point of view." They contain something over and above the physical and biological level, Dewey agrees, something of "the nature of individual temporal sequences."

Conclusions:

1. The contemporary "holistic" philosophies of Smuts, Lossky, and Whitehead as well as the historic views of Plato, Goethe, Kant, and Hegel raise the problem of whether wholes require a special mode of comprehension over and above some kind of analysis.

2. Analysis, in some of its versions, ignores the unique and "qualitatively different" properties of wholes that enable us to differentiate between a whole and an aggregate, between analysis and division and the separating out of qualities.

3. At best analysis puts those properties "in relief" but gives them no special importance or privilege in relation

to parts and order in a whole.

4. In many writings on synopsis and analysis those methods have been distinguished vaguely or verbally.

5. Synopsis, it should be said with historical right, sees the specific and "qualitatively different" properties of a whole as nuclear to its nature and central to understanding it.

6. Scientific methodology is synoptic in the physicist's emphasis on "fields," the psychologist's stress upon wholes, the biologist's interest in the "holistic functioning" of the organism, and in the recognition of the unique character of social phenomena.

7. The understanding of wholes requires both analysis and synopsis because without analysis we cannot tell whether and how an object is a whole and without synopsis we miss or minimize the "qualitatively different" properties of a whole which are nuclear to its nature and are the means of testing our analysis.

AUTOBIOGRAPHICAL

SKETCH

Loyd David Easton, son of Boyd J. Easton and Elda Holden Easton, was born July 29, 1915 in Rockford, Illinois. He attended Highland School until 1928 when he went to Lincoln Jr. High School. In 1930 he entered Rockford Sr. High School from which he graduated in 1933. From DePauw University he received the A. B. degree in 1937. Two years later, in 1939, he was awarded the A. M. degree at Boston University. Since 1938 he has been a candidate for the degree of Doctor of Philosophy at Boston University, but during the academic year 1941-1942 he studied at Harvard. He was a graduate assistant in the philosophy department at Boston University until 1939 when he was elected Borden Parker Bowne Fellow, which position he occupied until the end of the academic year in 1940.